TECHNOLOGY

REVIEW

July 1956



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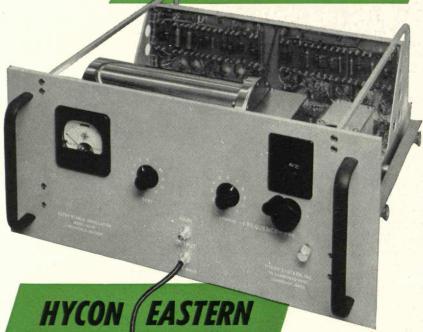
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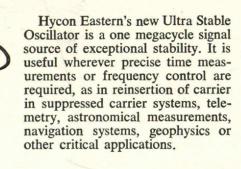
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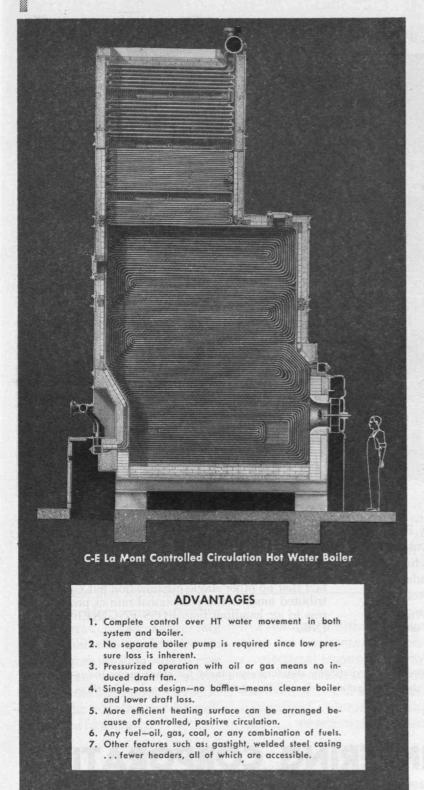
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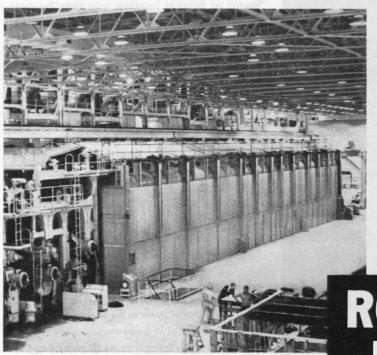
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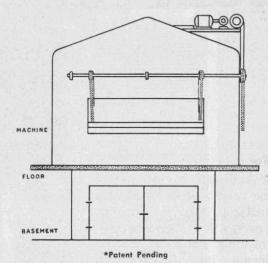
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THE TECHNOLOGY REVIEW

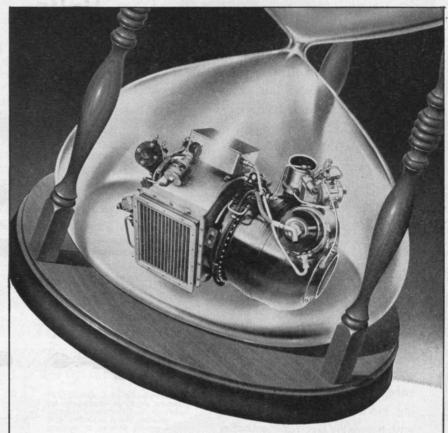
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"We were so intrigued by a demonstration... of the fail-safe method... that I thought you should know about it in connection with the extreme importance of circuitry in reactor control... The simplicity of the operation is really remarkable, in fact none of us can see any way in which it can fail."

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Mix well and Serve... Cold!

How today's Pre-mix dispensers and vendors were developed . . . to assure thirsty people everywhere of perfectly blended soft drinks—every time!

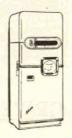
Some of us remember the 2-cents-a-glass lemonade stands of years ago . . . and how a few lemons were stretched to produce several gallons of "lemonade." Certainly the product was substandard, and seldom worth the pennies collected for it.

Strange to say, the producers of commercially perfected soft drinks have—through the years—been faced with similar problems. They developed formulas for soft drinks that pleased the public palate . . . concentrated them to simplify handling and lower costs . . . then provided easy-to-follow instructions for mixing and serving that were virtually foolproof.

Almost foolproof . . . but not quite. At all times, the producer of the soft drink was at the mercy of the individual serving the drink . . . and the desire for an automatic dispenser of pre-mixed beverages was born.

If perfected, a Pre-mix dispenser would assure the serving of a scientifically measured and blended product . . . prepared with pure, filtered water . . . of identical consistency wherever and whenever served. Equally important, such a dispenser would enable soft drink producers to extend their service to outlets heretofore inaccessible due to bottle-handling problems—and overall distribution costs would be lowered.

As far back as the 1930's, engineers and inventors sought to develop a Pre-mix soft drink dispenser. But not until 1949 did the Pre-mix dispensers and vendors become a reality . . . when Glasco engineers



Glasco Automatic PRE-MIX Vendor, available in one-, two-, or three-product units. Holds 800 six-ounce drinks.



and other M.I.T. alumni, in consultation with M.I.T. staff members, developed the automatic machines that would "Mix well and serve . . . cold!"

Actually, in the process of developing the Glasco Automatic Premix Vendor, thousands of ideas were tried and discarded before a successful and practical automatic dispenser was completed. Insulated cabinets, pre-cooled product tanks, stainless steel dispensing valves, revolutionary types of refrigeration units . . . and more than 200 types of rubber compounds, plastics and integral elements . . . were created and tested.

By late 1951, ten Glasco Automatic Pre-mix Vendors were in operation. In 1952, an order for 100 units required the obtaining of the approval of the board of health in a large city. . . the first sanction ever given to a cup-vending soft drink machine.

At this point Raymond Loewy was called upon to create the streamlined, sales-appealing cabinet design so necessary in today's automatic merchandising machines . . . and developed an eye-catching, red and white style that has set a new trend in the automatic dispenser field.

Since 1955, production of Glasco units has furnished hundreds of bottlers with many thousands of Automatic Pre-mix Vendors and Dispensers . . . and they've proved to be sensational merchandising tools that win customer praise and actually increase sales to higher volume with outlets everywhere.

Today, wherever thirsty people travel, pause, work or play, Glasco Automatic Pre-mix Vendors can supply America's most popular soft drinks . . . scientifically prepared in the bottling plant and served, refreshingly cold, in a sanitary cup. Glascock Brothers Manufacturing Co., Muncie, Indiana.



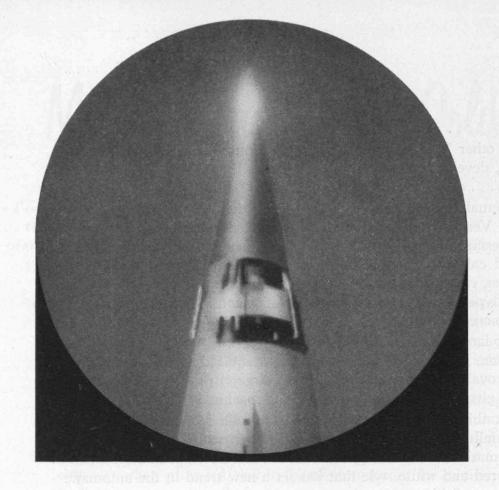
Glasco Counter Electric PRE-MIX Dispenser, available in one-, two-, or three-product units according to the need.



Glasco Counter Remote PRE-MIX Dispenser, available in one-, two-, or threeproduct dispensing units.



Glasco Carry-Pack PRE-MIX Dispenser, 50-drink capacity; fiberglas insulation . . . drinks stay cold for hours.



HOT TIP

(For Electronicists)

The big count-down has begun! In a matter of months, the tip of a Martin rocket will travel through space at a speed of 5 miles per second—and moments later the first man-made satellite will reach its orbit.

This event, the first of a series of 12 in the Martin-Navy VANGUARD program, will commence a new chapter in the short but exciting story of electronics.

Today, no other engineering organization in the world is more concerned with the outer-space electronics problems of tomorrow.

If you are interested, contact J. M. Hollyday, Dept. TR-07, The Martin Company, Baltimore, Maryland.



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THE TABULAR VIEW

Bulwark—This year's Commencement Address provided the graduating class with a bulwark of strength as it left academic halls to seek its fortune. The address "Leadership Through Education in America" (page 471) was delivered by Neil H. McElroy, President of the Procter and Gamble Company and Chairman of the Committee for the White House Conference on Education. After receiving the A.B. degree from Harvard University in 1925, Mr. McElroy joined the Procter and Gamble Company in Cincinnati, with which he has since been associated in various administrative capacities, becoming president in 1948. He is also active in many civic and industrial affairs in Cincinnati.

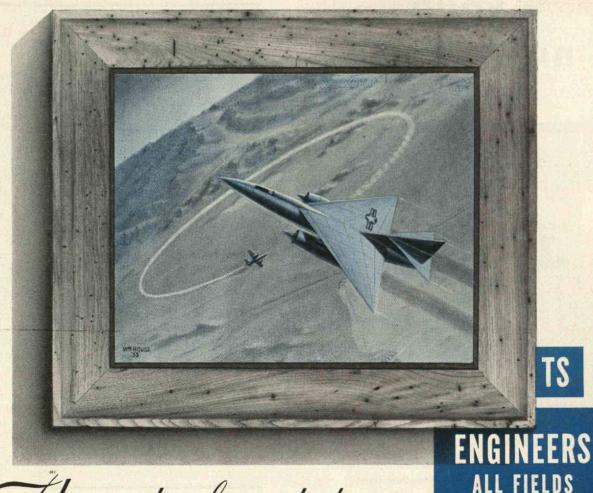
Encouraging Dispatch—Opening the Alumni Day Symposium with a paper "Science and the Health of Mankind" which The Review presents with pride (page 474), Henry van Zile Hyde painted a broad and authoritative picture which other symposium speakers amplified. Dr. Hyde received the A.B. degree from Yale University in 1929 and the M.D. degree from Johns Hopkins University in 1933. He has had a distinguished and varied career in medicine and public health in the Middle East, Central and South America, Europe, and North America. Dr. Hyde is currently chief of the Division of International Health, U.S. Public Health Service, in Washington, D.C.

Valiant Undertaking—Gordon M. Fair, '16, Gordon McKay Professor of Sanitary Engineering and Abbott and James Lawrence Professor of Engineering at Harvard University, outlined the valiant undertaking of sanitary engineers in promoting man's health. His address "Sanitary Engineering and Man's Health" (page 477) shows the significant—and generally overlooked—role of engineering in making the life of the human race more healthful. Professor Fair received the S.B. degree in 1916 from M.I.T. and Harvard University, an honorary M.S. degree from Tufts College in 1934, and an honorary doctorate from the Technische Hochschule, Stuttgart, in 1951. He has had an active and brilliant career in sanitation and public health since he joined the faculty of Harvard University in 1918.

Exhilarating Denouement—In "Food and Agriculture and Man's Health" (page 479), J. George Harrar provides an exhilarating denouement of the benefits mankind can achieve through proper use of the world's land. Dr. Harrar received the A.B. degree from Oberlin College in 1928, the M.S. degree from Iowa State College in 1929, and the Ph.D. degree from the University of Minnesota in 1935. From 1934 to 1942 he was faculty member at the University of Minnesota, Virginia Polytechnic Institute, and Washington State College. Since 1943 he has been associated with the Rockefeller Foundation, first as local director, Mexican Agricultural Program, then as deputy director for agriculture, and since 1955, as director for agriculture.

Robust Life—As his contribution to the Alumni Day Symposium, Francis O. Schmitt discussed "Biological Sciences and Man's Health" (page 481), and emphasized that results of studies of biology at the molecular level, now going on, would aid man in achieving the robust life. Dr. Schmitt received the A.B. degree in 1924 and the Ph.D. degree in 1927 from Washington University; he has also studied at the University of California, University College in London, and the Kaiser Wilhelm Institute

(Concluded on page 450)



The art of rocketry

The portraits of tomorrow's propulsion systems are rapidly becoming realities at Aerojet-General. America's foremost manufacturer of rocket powerplants, Aerojet is a major contributor to this nation's most critical rocket and missile programs.

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Reactor Development Division • Department H, Windsor, Conn.

THE TABULAR VIEW

(Concluded from page 448)

of Berlin-Dahlem. From 1929 to 1941 he was faculty member at the University of Washington, and from 1941 to 1955 was head of the M.I.T. Department of Biology. He is now one of two Institute Professors free to concentrate on any study or research of his choosing.

Life Exuberant—Final speaker in the Alumni Day Symposium was John G. Trump, whose address "Physical Sciences and Man's Health" (page 483) outlined the role of the physical sciences in making man's life exuberant. Dr. Trump received the B.S. degree in electrical engineering in 1929 from the Polytechnic Institute of Brooklyn, the M.A. degree from Columbia University in 1931, and the Sc.D. degree from M.I.T. in 1933. He has been a member of the M.I.T. Department of Electrical Engineering ever since 1933, becoming professor in 1952. Dr. Trump is especially noted for his work in medical applications of high voltage accelerators.

Yearly Yarn—In his Alumni Day luncheon address, President James R. Killian, Jr. made his eighth annual report on M.I.T. progress, which The Review proudly presents (page 485). Receiving the S.B. degree from M.I.T. in 1926, Dr. Killian began three decades of service to M.I.T. as editor of The Technology Review. In 1939 he became Administrative Assistant to President Karl T. Compton, and his conduct of the Institute's administration was such that he was made the Institute's ninth president in May 1949. Dr. Killian also carries on an active and important role in serving the nation in various educational and scientific capacities.

The Review is not published during the summer months following July. This issue, therefore, concludes Volume 58. Number 1 of Volume 59 will be published on October 27 and dated November. Readers who bind their copies are reminded that if they possess nine issues of Volume 58, their files are complete. An index to the volume will be ready on September 15 and will be supplied post free upon request.

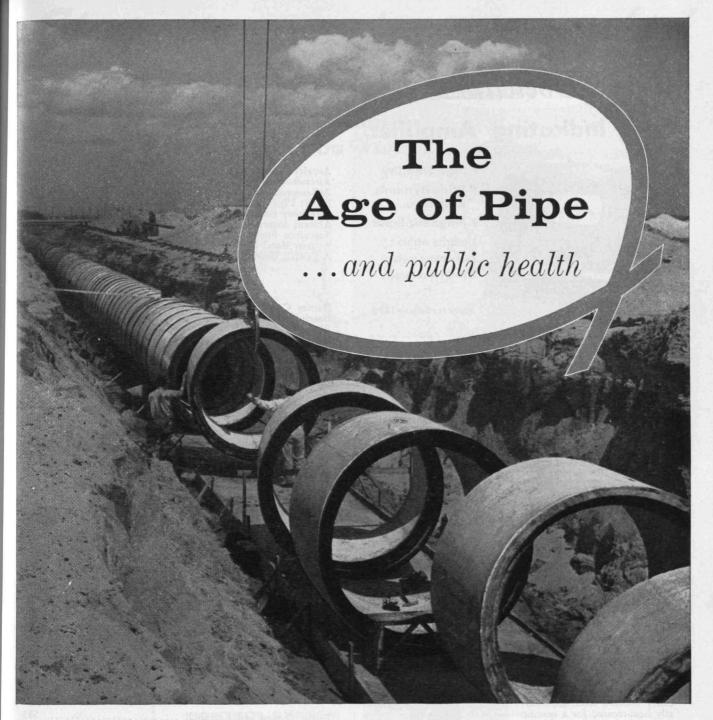


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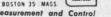
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The D-C Indicating Amplifier, Model 2HLA-3, is a completely self-contained instrument for amplification and measurement of minute d-c signals. A new design concept utilizing the DOELCAM Second-Harmonic Magnetic Converter as the input stage avoids the limitations of the usual mechanical type converters and results in improved performance.

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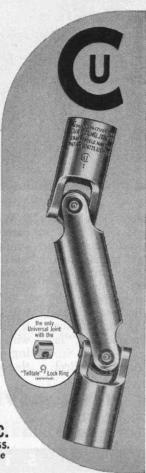
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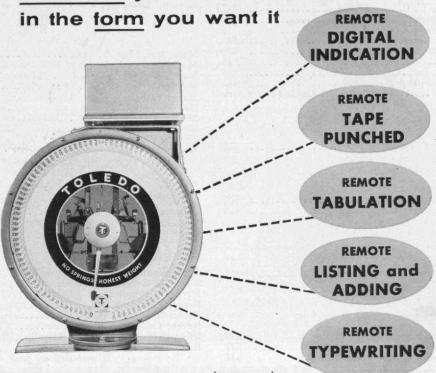
INDEX TO ADVERTISERS

July, 1956

Advertiser	Page
A	
Aerojet-General Corporation Aircraft-Marine Products, Inc. AiResearch Manufacturing Company Albert Pipe Supply Company, Inc. Allegheny Ludlum Steel Corporation Alumni Association	449 458 439 456 507 529 451 448 512
В	
Barney Corporation, W. J. Beech-Nut Packing Company Blanchard Construction Company Bludworth Marine Boston Manufacturers Mutual Fire Insurance Company Brandeis, Goldschmidt and Company, Inc. Brewer, Given Brook Motor Corporation	450 523 531 520 503 522 535 508
C	
Capitol Engineering Corporation Chauncy Hall School Cleverdon, Varney and Pike Coburn and Company, William H. Combustion Engineering, Inc. 437, Converse Rubber Company Curtis Universal Joint Company, Inc.	535 534 535 529 450 521 452
D	
DeBell and Richardson, Inc. Debes and Associates, Charles Nelson Deccy Products Company de Florez Company, Inc., The Dexter Chemical Corporation Diefendorf Gear Corporation Doelcam Dostal Foundry and Machine Company Douglas Aircraft Company, Inc. Drake and Townsend, Inc. Draper Corporation Dwight Building Company, The	500 535 529 522 510 456 452 516 510 528 536 531
E	
Eadie, Freund and Campbell	535
Fabric Research Laboratories, Inc. Fairfield and Ellis Fay, Spofford and Thorndike, Inc. Ferre Industries Fletcher Company, H. E. Flush-Metal Partition Corporation Foundation Company, The	535 530 535 515 506 Cover 447
of secretary and the contract of the contract	enstra di lan
Gannett Fleming Corddry and Carpenter, Inc. Garrett Corporation, The General Radio Company Gilbert Associates, Inc. Glascock Brothers Manufacturing Company Goodrich Company, The B. F. Goodyear Tire and Rubber Company, The Graver Tank and Manufacturing Company, Inc. Gray Corporation, Peter (Continued on page 454)	535 439 Cover 535 445 501 464 443 530

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INDEX TO ADVERTISERS

(Continued from page 452)

Advertiser	Page	Advertiser	Page
н		Liquid Carbonic Corporation, The Lougee and Company, N. A Lummus Company, The	534
Hamilton and Sons, W. C. Hart Products Corporation, The	520	E LOVE TO THE BEST PRO	
Haskell-Dawes Machine Company Hevi Duty Electric Company	518 502	M	
High Voltage Engineering Corporation	509	Main, Inc., Chas, T	525
Hinde and Dauch	519	Manufacturers Mutual Fire Insurance Company	511
Holmes and Narver, Inc.	534	Maritime Steel and Foundries Limited	
Hughes Aircraft Company Hycon Eastern, Inc	462 Cover	Martin Company, The	
Liyeon Lastern, Inc	COVEL	Mason Company, L. E	
		Melpar, Inc. Metcalf and Eddy	
		Miniature Precision Bearings, Inc.	
I . E		Moog Valve Company, Inc	440
Instron Engineering Corporation	516	Moran, Proctor, Mueser and Rutledge	535 503
		P	
Jackson and Moreland, Inc	535		
Jones and Laughlin Steel Corporation	455	Plymouth Cordage Company	442
		Precision Products Company Inc of Waltham	514
K			
		R	
Kerite Company, The	525		
Kohler Company	454	Ramo-Wooldridge Corporation, The	499
Kuljian Corporation, The	535	Raymond Concrete Pile Company	525
		Raytheon Manufacturing Company	448
L		Reidy, Maurice A	535 461
		Revere Copper and Brass, Inc.	497
Leonard Construction Company	534	Richards Company, Inc., Arklay S	456
Lexington Insurance Company	532	Robbins Company, Inc., John A	517
Lilly Varnish Company of Massachusetts	531	(Concluded on page 456)	

KOHLER ENGINES

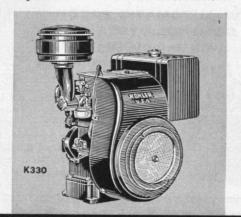
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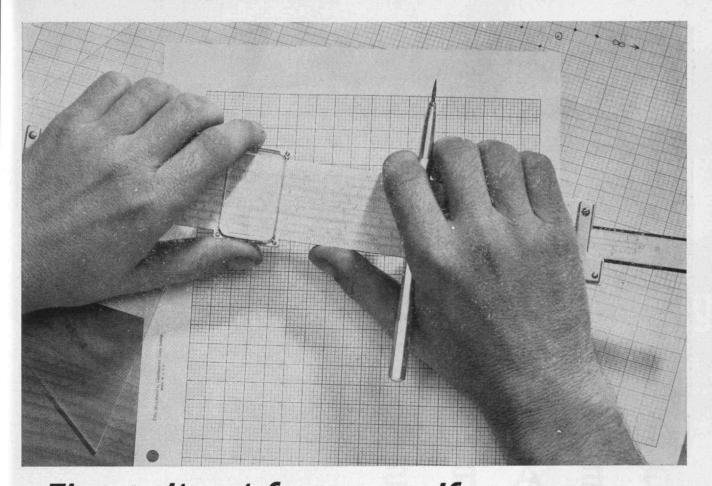


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INDEX TO ADVERTISERS

(Concluded from page 454)

Advertiser	Page
Ross Engineering Corporation, J. O	438 534
s	
Sawyer Associates Construction Company, Inc. Scientific Design Company, Inc. Scientific Design Company, Inc. Scully Signal Company Scully Signal Company Sperry Gyroscope Company Sperry Gyroscope Company Sprague and Henwood, Inc. Standard Oil Company (Indiana) Stevens-Arnold, Inc. Stone and Forsyth Company Syska and Hennessy, Inc.	505 520 463 460 527 519 518 527
T	
Taylor and Sons, Thomas Technology Press, The Toledo Scale Company Tredennick-Billings Company, The Tubed Chemicals Corporation	498 453 529
U	
Union Oil Company	459
w	
Wheeler Construction Company Whirlpool-Seeger Corporation Wolfe Company A. I	524 457 531

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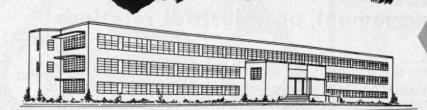
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In antenna and microphone circuits, which are followed by high-gain amplifiers, signals are often very small and can easily be masked by noise voltages. In the M.I.T. tests, a standard noise source (an integral part of the amplifier) was used and the noise figure both with and without the A-MP Connectors was measured. In order to make the tests more stringent, the Connectors were first subjected to salt-air corrosion. When they were inserted into the amplifier, no detectable change resulted in the noise figure.

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Robert Angell

... or how automation makes more and better paying jobs

You hear a lot of talk these days about how automation is going to cost people their jobs.

"Me, I work in the most 'automatized' industry of them all—petroleum. And far from costing me my job, automation has made it a better one.

"When I was just getting started in the refinery back in 1925 the average production for the industry was 32 barrels



of product a day per man. The average investment in refinery tools at the time was \$10,000 per man.

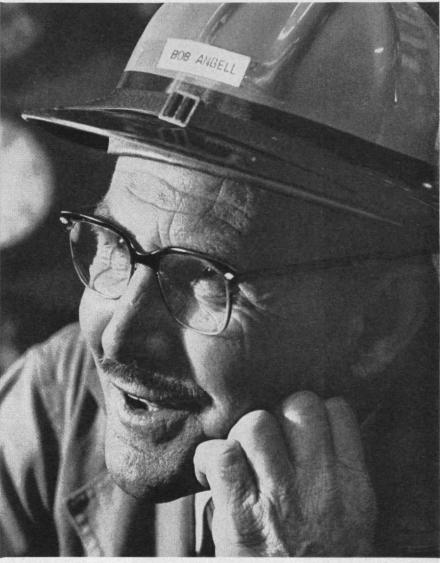
"Today the industry's investment in tools for each refinery employee is \$50,000. Offhand you'd think that that much machinery would put some refinery people out of work. But just the opposite is true.

"Back in 1925 the refineries employed just over 65,000 people. Today they give jobs to over twice as many—133,000. What's more, our production has gone up to 59 barrels a day per man.



"We produce these 59 barrels in 40 hours a week, instead of the old 51 in 1925. And we make more money. In my case my pay is up 288.89% since I started on the job.

"If this is automation, I'm all for it."



"MY PAY IS UP 288%. IF THIS IS AUTOMATION, I'M ALL FOR IT."

Automation, it seems to us here at Union Oil where Angell works, illustrates again the basic strength of America's free competitive economy.

So long as business *has* to compete, it must constantly improve its products. This calls for the fullest use of new and better machines.

This has sometimes caused temporary readjustments in an industry. But in the

long run it creates better paying jobs for more and more people.

Which is another reason why the number of Americans at work and the standard of living they enjoy continue to climb.

YOUR COMMENTS ARE INVITED. Write: The President, Union Oil Company, Union Oil Building, Los Angeles 17, California.

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THE MISSILES SYSTEMS DIVISION

Drawing on a 50-year history of engineering accomplishment, Sperry now adds a Missiles Systems Division to its ever-expanding organization.

"Firsts," of course, are an old story with Sperry engineers. From the installation of the first gyro-compass aboard a Navy warship, back in 1911, to a myriad of electronic wonders today, Sperry has been busy marking milestones of progress. And Sperry Engineers are eminently qualified to embark on their newest project. Their vast experience with missiles and associated systems make them intimately acquainted in this field. As a matter of record, way back in 1918 Sperry engineers successfully developed the first radio-controlled "guided missile."

What all this means to engineers in search of a rewarding life work should be clear. In Sperry's new Missiles Systems Division, major opportunities are unfolding. Not only can you now tap the tremendous potential in the field of missiles and pilotless air-borne devices, but you can do so from the well-established base of a stable organization. Over 1500 employees have been employed by Sperry for more than 15 years. And, as Sperry grows, you will grow . . . in professional stature and in personal gain.

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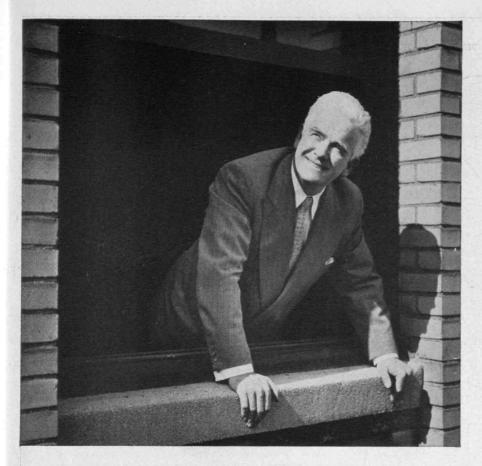
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Bought Blue Sky ...Reaped Profit

Some industries invest in electrical precipitators for one reason only—to avoid creating smoke nuisance. Blue sky—clean stack discharge from a plant—is a good advertisement, basic in any factory community relations program.

But here is an instance where electrical precipitators pay high cash dividends as well. A major producer of pulp and paper uses 22 Cottrell Precipitators, installed by Research Corporation, to recover salt cake from various processes. Over 150,000 tons of this chemical are thus reclaimed each year for re-use—\$3,000,000 that goes on the happy side of the ledger rather than up the stacks.

In a case like this, the collection efficiency of the equipment is of high dollar importance, just as it is in oil refineries where catalyst is recovered . . . in chemical plants where sulphuric and phosphoric acids are recovered . . . and in non-ferrous smelting plants where escape of valuable metallic dust and fume is prevented.

The higher the efficiency, the bigger the pay-off... or the cleaner your stacks will look, if your objective is nuisance abatement. But how do you make sure of getting highest efficiency?

First, remember that electrical precipitators are no simple, standard device. For best results, for true economy, each installation must be custom engineered. And that engineering should be based on successful past experience in meeting similar requirements and conditions.

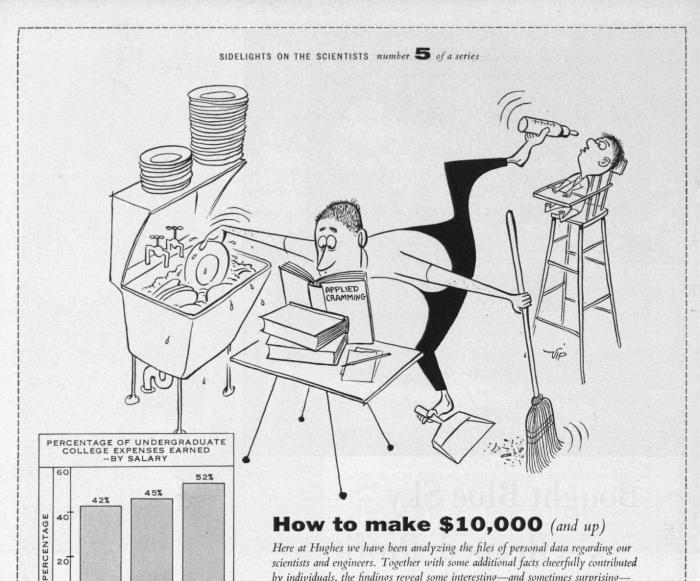
The designer-builder with by far the largest total and broadest-ranging experience is Research Corporation. Research has designed and sold more than 2000 precipitators during the past 40 years. This experience is available to help you solve your problem, whether it's gas cleaning, nuisance abatement, recovering valuable materials, or, perhaps, some precipitator application that has never been attempted before.

Your questions will be welcomed and please be sure to write for a copy of Bulletin GB, a quick summary of dust collection problems and facts of interest to management men.

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Dr. Joseph W. Barker, '16, Chairman of the Board

V. P. Cook, '35, Field Engineer



by individuals, the findings reveal some interesting—and sometimes surprising—
group characteristics and relationships. In this series we shall chart and attempt to
interpret the results for you.

Data obtained from a 20% random sample of the 2400 professional engineers and scientists on the staff of Hughes Research and Development Laboratories.

SALARY

College Expenses Earned . . . and Present Salaries

The chart shown here represents the percentage of undergraduate college expenses earned—by present salaries at Hughes. The net result of this comparison is, that the higher the present salary of the individual—the more he earned while an undergraduate. College jobs included baby-sitting, "hashing", collecting laundry, lawn-mowing, car-washing, etc., etc. One scientist included in his list of college jobs—"Walking the Dean's rheumatic bulldog."

In the Hughes laboratories more than half of the engineers and scientists have had one or more years of graduate work; one in four has his Master's; one in 15 his Doctorate. Our research program is of wide variety and scope, affording exceptional freedom as well as superior facilities for these people. From every standpoint, it would be difficult to find a more exciting and rewarding climate for a career in science. Too, we are continually stepping up projects which will insure success in commercial as well as military work.

Hughes is pre-eminent as developer and manufacturer of the electronic armament control system now standard equipment on all Air Force all-weather interceptors. Our program also embraces ground systems radar, the Hughes Falcon and other guided missiles, automatic control, synthetic intelligence. Projects of broader commercial and scientific interest include research in and manufacture of semiconductors; electron tubes; digital and analog computation; data handling; navigation; production automation.

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EDITED AT

THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY



David Shepard'26 and Raymond Mancha'26 "with my banjo on my knee" at Alumni Day Banquet, on June 11

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CONTENTS

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PARENT'S PROCESSION TO COMMENCEMENT EXERCISES

THE COVER

NEWS AND VIEWS OF COMMENCEMENT AND ALUMNI DAY

Frontispiece 466

LEADERSHIP THROUGH EDUCATION IN AMERICA

By NEIL McElroy 471

SCIENCE AND THE HEALTH OF MANKIND

BY HENRY VAN ZILE HYDE 474

SANITARY ENGINEERING AND MAN'S HEALTH

BY GORDON M. FAIR 477

FOOD AND AGRICULTURE AND MAN'S HEALTH

By J. George Harrar 479

BIOLOGICAL SCIENCES AND MAN'S HEALTH

By Francis O. Schmitt 481

PHYSICAL SCIENCES AND MAN'S HEALTH By John G. Trump 483

A REPORT ON PROGRESS AT M.I.T. . . By James R. Killian, Jr. 485

COMMENCEMENT AND REUNION—A TECHNOLOGY REVIEW REPORT

THE TABULAR VIEW • Contributors and Contributions 448

THE TREND OF AFFAIRS • News of Science and Engineering 467

THE INSTITUTE GAZETTE • Relating to the Massachusetts Insti-

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Views and News

As frontispiece this month, The Review presents a selection of views of events of Commencement and Alumni Day. In clockwise order, beginning at the upper lefthand corner are: 1. Three generations of Technology Alumni: Warren G. Hamblet, Jr., '26, father, and George W. Hamblet, '88, grandfather, of James E. Hamblet, '56. 2. President Killian (left) beams admiring approval as Vannevar Bush, '16, receives certificate of appreciation from Dwight C. Arnold, '27 (right). 3. Margolia N. Cohen, '56, and Lloyd Gilson, '55, plan a September wedding, as they both receive degrees from M.I.T. 4. Mah Balakul of Bangkok witnesses the graduation of his daughter, Niramol Bulakul, '56. 5. One of several tables of the Class of 1931 at the Alumni Day Banquet in Rockwell Cage, 6. A few members of the Class of 1906 at the Alumni Day Banquet. 7. Theodore T. Miller, '22, president of the Alumni Association, for the year beginning July 1, 1956. 8. Mrs. Oscar F. Hedlund attends the banquet at which track coach Oscar F. Hedlund is made honorary member of the Alumni Association.











THE

TECHNOLOGY

REVIEW

Vol. 58, No. 9



July, 1956

The Trend of Affairs

Institute for Defense Analyses

Establishment of an agency for research on military problems, the Institute for Defense Analyses, was announced recently at M.I.T.—one of five educational institutions participating. The new agency, a nonprofit corporation, will conduct scientific analyses of present and future weapons systems for the Weapons Systems Evaluation Group, which was established by the Department of Defense in 1949. Other initial members of the Institute for Defense Analyses are California Institute of Technology, Case Institute of Technology, Stanford University, and Tulane University.

James R. Killian, Jr., '26, President of M.I.T., has been elected chairman of the board of trustees* of I.D.A. and Major General James McCormack, Jr., '37, U.S. Air Force (retired), who was appointed special adviser to Dr. Killian last November, has been elected president. Offices of I.D.A. in Cambridge and in Washington were established last November when M.I.T. entered a Department of Defense contract to inaugurate the program.

Trustees are: Dr. Killian; Lee A. DuBridge, President, and George W. Green, Comptroller, of California Institute of Technology; T. Keith Glennan, President, and Thomas P. Murtagh, Treasurer, of Case; Frederick E. Terman, '24, Provost, and Thomas W. Ford, Contract Administrative Officer, of Stanford; Rufus C. Harris, President, and Joseph C. Morris, Vice-president, of Tulane; and Philip M. Morse, Director of the Computation Center at M.I.T.

Albert G. Hill, former director of Lincoln Laboratory, air defense center operated by M.I.T. for the Department of Defense, has been named director of research for I.D.A. and has assembled a staff of civilian scientists and engineers in Washington.

The Weapons Systems Evaluation Group functions under the administrative direction of the Assistant Secretary of Defense for Research and Development and makes studies for the Joint Chiefs of Staff and the Secretary of Defense and also originates studies. It provides the Department of Defense with comprehensive, objective, and independent analyses and evaluations of present and future weapons systems upon strategy, organization and tactics, and the comparative effectiveness and costs of weapons systems. Advice is given to aid the Department in making decisions concerning the allocation of resources for the most effective combination of weapons systems.

"It is a most important objective in W.S.E.G. to achieve the closest possible integration of military and scientific thought in attacking its problems," General McCormack said.

In announcing the establishment of W.S.E.G., Secretary James Forrestal in 1949 outlined its broad objectives in these terms: "The problem of national security is so serious that every reasonable effort should be made to get the best answers by the application of the scientific method. The speed at which the technology of war has changed and will change; and the complex interactions of technology with tactics, strategy, and logistics in total war are such that military judgement alone is not enough. If we are to exploit fully the power of modern analysis, scientific methods for examining the nature of future war should be employed in the broadest possible sense."

The present director of W.S.E.G. is Lieutenant General Samuel E. Anderson, U.S.A.F., Commander of the 7th Air Force during the war in Korea.

General McCormack was formerly deputy commander and vice-commander of the Air Force Research and Development Command. A graduate of West Point, he was a Rhodes scholar at Oxford University and in 1937 received a degree of master of science in Civil Engineering at M.I.T.

LOCATIONS OF THEORETICAL POPULATION CENTER OF M.I.T. ALUMNI RESIDENT IN CONTINENTAL UNITED STATES: 1900-1955

Year	No. of Alumni	North Lati- tudes		Description of Location
1955	40,899	40°39′	80°54′	3 miles NW of Salineville. Columbiana County, Ohio
1948	33,737	41°13′	79°59′	2 miles SE of Wesley, Venango County, Pa.
1940	27,027	40°58′	78°58′	Northern outskirts, Punxsutawney, Jefferson County, Pa.
1935	22,762	41°10′	78°36′	3 miles SW of Penfield, Clearfield County, Pa.
1930	17,768	41°14′	78°25′	4 miles SE of Weedville, Clearfield County, Pa.
1925	15,768	41°16′	78°38′	5 miles NW of Penfield, Clearfield County, Pa.*
1920	12,699	41°21′	78°17′	1 mile W of Dents Run, Elk County, Pa.
1915	10,979	41°28′	78°44′	3 miles N of Ridgway, Elk County, Pa.
1909	6,287	41°29′	78°27′	11 miles SW of Emporium, Elk County, Pa.
1905	2,837†	41°26′	78°7′	11 miles SE of Emporium, Elk County, Pa.‡
1900	2,123†	41°41′	77°17′	4 miles N of Antrim, Tioga County, Pa.

* Actual center located in Elk County

† Including degree holders only

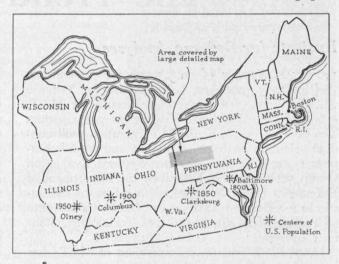
‡ Center located in Cameron County

Westward Ho!

RESULTS of recent studies of the noticeable west-ward and southward trends in the geographical distribution of the Institute's living Alumni resident in the Continental United States were summarized in his annual report presented to the Alumni Council on May 28 by H. E. Lobdell, '17, Executive Vice-president of the Alumni Association.

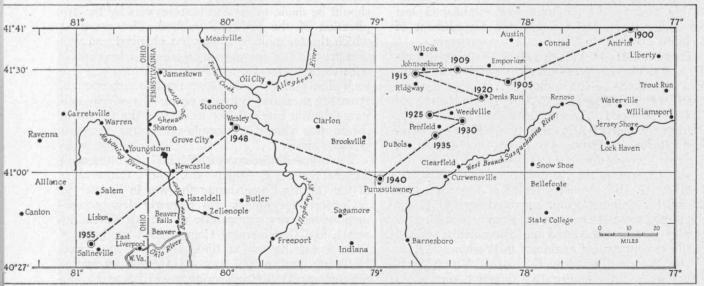
In 1915 Alumni residing in the North Atlantic regional area accounted for 71 per cent of the total Alumni in the United States, whereas in 1955 they accounted for but 61 per cent. During the same interval, the corresponding percentages of the U.S. total rose from 6 per cent to 11 per cent in the South Atlantic region, and from 8 per cent to 10 per cent in the Western region. In 1955 Massachusetts continued to rank as the state having most Alumni but it had 26 per cent of the U.S. total contrasted with 42 per cent in 1915. Meanwhile, California, which in 1915 ranked fifth with less than 4 per cent of the U.S. total, by 1955 ranked third with 7 per cent.

In an endeavor to measure the effect of these and other shifts on a national scale, the theoretical popu-



Between 1900 and 1955 centers of alumni population moved through Pennsylvania and Ohio as indicated on the map below, which covers that portion of the United States shown shaded on the small map above.

M.I.T. Illustration Service



lation center of Alumni resident in the Continental United States has been computed at intervals of approximately five years since the turn of the century. Data for this purpose, back to 1909, have been obtained from geographical listings in successive editions of the Alumni Register, and for the years 1905 and 1900 from listings in the Register of Graduates.

At the beginning of the 1900's, the center of alumni population was at a point about four miles north of the village of Antrim in Tioga County, Pa. (at latitude 41° 41′ N and longitude 77° 17′ W); in early 1955, it was about three miles northwest of the village of Salineville in Columbiana County, Ohio (latitude 40° 39′ N and longitude 80° 54′ W). The 1955 point was 72 miles south and 189 miles west of the 1900 point. Centers of alumni population for intermediate years are shown in the large map and are tabulated on the opposite page.

The average rate of movement of the alumni center, since 1900, has been appreciably faster than that of the population center for the entire country as reported by the Federal Census. The alumni center has moved southward at a yearly average of 1.3 miles compared with 0.44 mile for the center of U.S. population; the annual westward move for Alumni was 3.5 miles compared with 2.53 miles for the nation's popu-

lation center.

Unlike the U.S. center, however, the center of Technology Alumni has not moved southward and westward uninterruptedly since 1900. During 1905–1909 and 1940–1948, it went north rather than south; and during 1915–1920 and 1925–1930, it reversed toward the east instead of continuing forward toward the west. But for the past 15 years, since 1940, the alumni center has pushed steadily westward advancing at a yearly average of 6.8 miles compared with a yearly westward average of 4.2 miles for the U.S. center.

MOVEMENTS OF THEORETICAL POPULATION CENTER OF M.I.T. ALUMNI RESIDENT IN CONTINENTAL UNITED STATES: 1900–1955

	Miles or Se		Miles East or West				
	Total	Yearly Average	Total	Yearly Average			
1900-55	71.8 (S)	1.3 (S)	189.3 (W)	3.5 (W)			
1940-55	21.4 (S)	1.4 (S)	101.2 (W)	6.8 (W)			
1948-55	38.6 (S)	5.7 (S)	50.6 (W)	7.2 (W)			
1940-48	17.2 (N)	2.2 (N)	50.6 (W)	6.3 (W)			
1935-40	14.5 (S)	2.9 (S)	18.8 (W)	3.8 (W)			
1930-35	4.8 (S)	0.5 (S)	9.4 (W)	1.9 (W)			
1925-30	2.1 (S)	0.4 (S)	11.5 (E)	2.3 (E)			
1920-25	5.5 (S)	1.1 (S)	18.3 (W)	3.7 (W)			
1915-20	8.3 (S)	1.7 (S)	23.0 (E)	4.6 (W)			
1909-15	1.4 (S)	0.2 (S)	14.6 (W)	2.5 (W)			
1905-09	4.1 (N)	1.0 (N)	17.8 (W)	4.4 (W)			
1900-05	17.9 (S)	3.6 (S)	43.4 (W)	8.7 (W)			
	term of the	SHEET AND THE					

Long-range speculation as to the future movement of our center is pointless in a quantitative sense, but one may at least suppose that it will continue westward. And, since in the past half century it has managed to surmount the Allegheny Mountains and reach the more level area of the state of Ohio, one may also suppose that in due course it will cross into Indiana — even as one may suppose that the U.S. center, which in 1950 passed over the boundary from Indiana into Illinois, will in due course transit the Mississippi.

Nuclear Reactor at M.I.T.

Plans for a nuclear reactor, to be built in Cambridge by the Institute for its programs of education and research in peaceful uses of nuclear science, have been approved by the Atomic Energy Commission. Construction work on the reactor, which has been designed to provide maximum safety and unusual versatility for training of nuclear engineers and for conducting nonclassified research, is expected to begin this summer.

Designed so that as many as 40 experiments can be conducted simultaneously, the reactor will be one of the most versatile research tools ever built for university use. It is anticipated that the reactor will be used by students and professors from a greater number of departments than any other M.I.T. research facility, and possibly also by industrial research

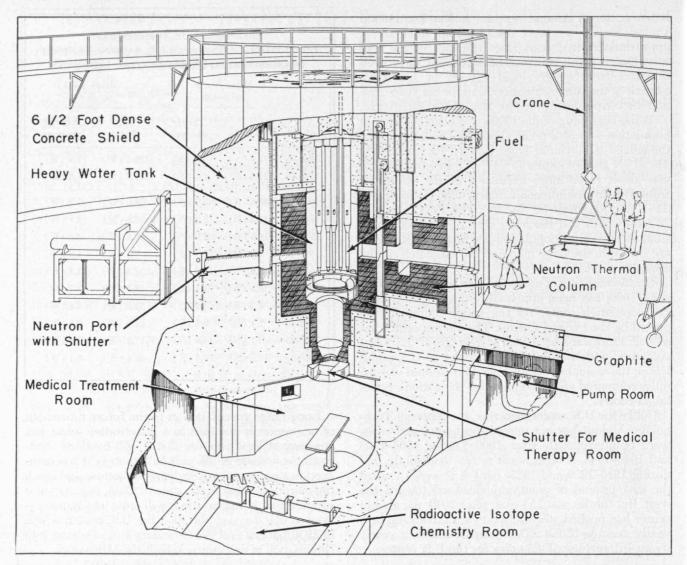
groups.

It is estimated that the total cost of building the reactor and its housing structure will be about \$2,400,000, of which part is already available for this purpose, leaving funds still to be raised for its completion. Final design and construction of the reactor is to be undertaken by A.C.F. Industries. Plans are for the reactor to be ready for operation in September, 1957.

Accessibility of the reactor to the Institute and to the medical and industrial center of metropolitan Boston is highly important, and has been a major factor in the design and location of the reactor. Theos J. Thompson, who directed construction of a research reactor at Los Alamos for the Atomic Energy Commission, before coming to M.I.T. as Associate Professor of Nuclear Engineering, is in charge of the reactor construction and design. He is assisted in this work by Thomas Cantwell, '48, research associate in the Department of Chemical Engineering. Manson Benedict, '32, Professor of Nuclear Engineering, is head of the Nuclear Engineering Program.

Two main uses planned for the M.I.T. reactor are to advance the Institute's program of graduate education in nuclear engineering, and to support a varied program of research. The reactor will be used as a principal facility in a nuclear engineering laboratory course. It will also be employed to teach engineers and scientists the theory, design, and operation of nuclear reactors; techniques for production, handling, and measurement of neutrons, gamma radiation, and radioactive materials; and the principles and applications of reactor instrumentation.

Studies which have been under way since spring, 1954, have indicated that a heavy-water moderated reactor, using enriched U²³⁵ as fuel, would provide



Construction of the M.I.T. nuclear reactor is shown in this drawing of the fuel elements (center) surrounded by tank of heavy water, graphite, and other shielding. A room on the lower level is available for medical research.

the best combination of the attributes of safety and usefulness for the Institute's needs. The reactor to be built will be similar in principle to that developed at the Argonne National Laboratory.

The reactor building will consist of a cylindrical steel shell, 70 feet in diameter, with a steel dome rising 50 feet above street level. In the center of the building will be the reactor. As shown in the drawing, its shield consists of a massive 600-ton block of concrete surrounding a shell of steel and lead. Inside this shell will be a graphite zone, and in the center of this zone will be a tank containing circulating "heavy water." Inside of this tank will be the 19 fuel elements, consisting of thin sheets of aluminum and U²⁸⁵ alloy sheathed in aluminum and contained in aluminum tubes three inches square and two feet long. When the reactor is in operation, this fuel will produce a nuclear reaction, giving off heat, neutrons, and gamma radiation. The heat will be carried away by the circulating heavy water. The neutrons are reflected back into the central region of the reactor by the graphite. Neutrons and gamma rays which penetrate the graphite are absorbed by the walls of steel, concrete, and lead shielding. Samples of materials can be inserted through the ports into the central region for exposure to radiation. At the design power level of 1,000 kilowatts, the reactor is expected to develop a maximum flux of about 1.5×10^{13} thermal neutrons per square centimeter per second.

Editorial Award

At the annual meeting of the American Alumni Council in French Lick, Ind., June 19, special recognition was given to The Technology Review for excellence of its editorial coverage of Alumni and Institute affairs. The citation states: "for significant editorial achievement in the field of alumni publishing, this certificate of Special Recognition is awarded to The Technology Review in the Annual Magazine Competition sponsored by the American Alumni Council."

The Review's entry – the first in a number of years – included articles on the Kresge Auditorium and M.I.T. Chapel (June, 1955 issue); Commencement and Alumni Day (July, 1955); Alumni Officers' Conference (November, 1955); and the dinner in New York on January 4, featuring "Science, the Mighty Multiplier" (March, 1956).

Leadership Through Education in America

COMMENCEMENT ADDRESS . . . BY NEIL McELROY

A commencement exercise is a stimulating event at any school in America; but being here today is especially inspiring to me. Along with millions of other Americans, I have, for many years, been a warm admirer of M.I.T. I am aware of the immense prestige enjoyed by this university throughout the world, and the contribution it and its graduates are making to a strong fast-developing nation.

Moreover, I must mention my affection and deep respect for your distinguished president. It has been my privilege to work closely with Dr. Killian in the activities of the Committee for the White House Conference on Education. Dr. Killian, as I am sure you know, made invaluable contributions to the work of that body. The group which he headed in a study of the question "What Should Our Schools Accomplish?" returned a report that may well do more to shape the objectives of our elementary and secondary schools than any other document of our time.

In that report, Dr. Killian's committee included these observations: "America deserves and can achieve increasingly better schools. . . . Educational programs which fully exercise and develop the abilities of especially brilliant students must be maintained. . . . Increasing stress must be placed on meeting the challenges of these students who have the capacity for the greatest intellectual growth."

These thoughts are shared by a great many educators, and by many of us who are not educators, and certainly they are reflected at this institution in the emphasis you place upon the quality of the individual intellect.

The concept of developing individual capacities through education has been important throughout our history in America. And from the standpoint of providing a basic education for all citizens, our country has put this concept into practice with unrivaled success. But we face today a crucial responsibility to do much more. Today we must make certain that we are utilizing to the full the capabilities of all of our people.

It is about this need for giving our youth full opportunity to achieve their optimum intellectual growth, and for recognizing and developing those of our young people who have special talents and aptitudes that I should like to talk to you briefly this morning. I should like to suggest why this is so vitally essential, to point out some of the problems involved, and to consider the means of their solution.

As the commencement procession is about to begin, President James R. Killian, Jr., '26 (left), Neil H. McElroy, President of the Procter and Gamble Company and commencement speaker (center), and J. A. Stratton, '28, then Provost but subsequently named Chanceller of M.I.T., gather for informal chat.

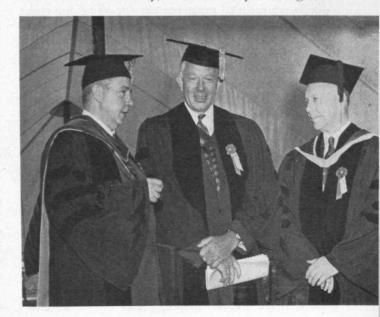
As to why so essential, let us note the great challenge confronting us as a people — the challenge of competition on a world front. Civilization has always been competitive. Competition seems to be the very nature of man and his society. Nations strive against nations — not only in wars, but in commerce, in industry, in culture, and other fields of human endeavor. And if we are realistic, we must recognize that the very survival of individual nations as strong and independent societies has depended upon the success or failure with which they have met this test.

Today this vital competition is more clearly defined, and is taking place on a far broader scale. We hear much of the race between the free world and the world of communism for supremacy in the development of colossal devices of destruction. And this, however awesome it may be, is a rivalry that commands our utmost attention. But there are other kinds of competition which exist in the world because the world is not only competitive but it is also stirring with a great hope that the knowledge that can destroy can also bring benefits and richer lives to all mankind.

To realize these aspirations involves leadership not only in science but also of a more general nature — leadership in the quality of thinking and vision; leadership in finding the solutions to social and political problems; leadership in inspiring the confidence of others.

Much of the world today rests in an uneasy balance, uncertain of which way to cast its lot. Let us make no mistake of the fact that great decisions will turn upon the caliber of leadership we offer on the one hand, and communism offers on the other.

We must realize that, in this international competition, we do not have numbers on our side. In sheer mass of humanity, we are heavily outweighed.





Dwight C. Arnold, '27, as president of the Alumni Association, opens the Commencement Exercises in Rockwell Cage on June 8. On platform are members of the Faculty, Corporation, and distinguished guests. Those about to receive degrees are seated on main floor, to the right of the audience in this view.

We have a much smaller reservoir from which to develop our intellectual sinews and leadership, and certainly we must depend upon something more than the volume of arms, legs, and backs we can throw into the myriad tasks of building our strength.

This being true, nothing becomes more critical to us than our ability to take full advantage of the potentials for strength we do have on our side. These potentials, first and foremost, rest in the talents of our people. The challenge of the century, then, comes to focus upon what we can accomplish toward maximum development of the latent talents and abilities of the young men and women of America. And inevitably, this problem will devolve in major part upon our performance in the field of education. Herein lies the key source of our strength.

Our beginning must be the provision of full precollege educational opportunities for all of our children. This is no small assignment. Our school population is increasing at a record rate. Generally, it is estimated that our primary and secondary school systems will need as many as half a million additional classrooms - and the teachers for them - by 1960. Today, with the impact of our increasing population only partially felt, too many of our children are in ill-lighted, crowded, substandard classrooms. Many of our good teachers are overworked; too few of the balance are qualified to teach and guide their pupils. It is imperative, if our schools are to remain the bedrock of our strength, that we do everything possible to provide all the facilities and able teachers necessary to give all our children an adequate primary and secondary education.

Some young people will and should find secondary schooling to be the terminal of their educational development. With completion of their high school studies, they must then be equipped to take an important place in our economy and our civic life. Those with good vocational training will be needed in growing numbers to meet the requirements of our rapidly expanding mechanization of industry. To serve our rising population and to gain higher standards of living, we must keep our national productivity on an upward trend. This we are doing through advances in technology that virtually amount to a new industrial revolution. Keeping pace with this revolution, building its highly complex machines, and maintaining and operating them will call for workmen and technicians trained at new levels in new fields and in new skills. These will be rewarding and satisfying jobs — to be filled by the young people coming from our vocational schools across America.

Of course, the greater number of those who terminate their formal education with high school will receive high school educations of a general liberal arts nature. With this background they will be prepared to make important contributions in a wide variety of other occupational fields. Moreover, all the graduates of our secondary schools should have an understanding of our economy, our government, our history, and our traditions as a people that will equip them well for better citizenship and better living. They will have reason to look ahead eagerly to their part in the progress of their community and their nation.

At present, some 80 per cent of all our secondary school students end their formal education with their high school diplomas. This percentage is too high. Not all of these students, by any means, *should* stop at this point. Many are youngsters of outstanding capability whose contribution to our society would be greatly enhanced by extending their education past the high school.

We might expect to find that practically all high school graduates who rank among the top 25 per cent of their class would be going on the college. The fact is that one out of every three in this top-ranking group is *failing* to go further. Additionally, there are many others below this top 25 per cent whose latent talents for leadership are being lost because we do not discover them and motivate them to go on to higher education.

Obviously we need to do much more toward finding our gifted young Americans and measuring their aptitudes for future leadership while they are in the secondary schools. Here is the place to give individual preparation, guidance, and encouragement to all those showing special capabilities for intellectual

development.

This process cannot wait until they are ready for college entrance. It must take place while there is still opportunity for each student to pursue the preliminary courses and activities that will best prepare him for successful college work. In this effort, however, a serious problem arises. There is not as yet a proven method by which high-potential students may be singled out early and their aptitudes measured with any great degree of accuracy.

When can the budding scientist first be detected, when the individual with unusual analytical powers, or judicial faculties, or administrative abilities? What, if anything, can be done to guide these talents and to motivate the individual so that he may channel them to his best advantage in later life?

The answers to these questions are not simple ones. We cannot yet put calipers against the human mind. We must nevertheless develop better ways to find and measure aptitudes during our students' early years in secondary school. We must work toward the best possible ways to find our most promising young people, appraise them, guide them, and motivate them.

One thing of utmost value that institutions of higher education can do in the field of academic research is to evolve the ways to meet these ends. If these institutions need money to finance this, American business should be prepared to supply it. Certainly, from a self-interest standpoint, it is of great benefit to all business enterprises to see that these outstanding minds and talents are located, developed, and applied to the continuing progress of our national life. The extreme problem in our rapidly developing economy is the shortage of leadership material for teaching, for research of all kinds, for the clergy, for business, for our military forces, for our labor leadership, and the many other facets of our national life. Recent studies carried on jointly by academic and business minds, which have attempted to forecast the key shortages that may be faced in the world several generations from now, indicate that the real bottleneck is likely to fall in the area of high caliber individuals who can provide the leadership that will then be needed by our greatly augmented population. It seems to me that nothing can be more important for American business than to encourage long-range planning toward avoidance of this bottleneck to the continued growth of our national and world economy.

In the areas of student guidance and motivation, the influence of the home and the teacher loom high. Professor Joseph E. Kahl of Harvard has found experimentally that a young person's aspiration to go to college is closely associated with the attitude of his family toward college attendance. In the face of the fact that each year at least 100,000 young men and women with superior qualifications for college and university education are not continuing beyond high school, it has been broadly believed that the answer could be found in improved financial aid. But that is only part of the solution. Scholarships can lower the barriers for those desiring to go to college and not having the necessary funds; they cannot reach the talented young person who simply is not motivated to want higher education. This is where the able and understanding teacher becomes invaluable.

In noting that student financial aid alone is not always the answer, I do not intend to understate the problem of financial handicaps. Certainly we have learned in America that the economic status of a young person or his family has nothing to do with his intellectual capabilities. And, just as we cannot afford to lose good minds because of lack of motivation, so we must put an end to losing them through lack of money. The doors to higher education must be kept open through scholarships, through grants, through loans, through every way that is feasible and right.

Now, let's assume that a variety of influences is successful in inducing a much larger share of our talented young men and women to continue their formal education beyond high school. Already colleges are full. What will colleges and universities have to do to carry their heavier educating responsibilities in the years ahead?

Based on youngsters who are now born and merely looking ahead to the day when they will reach college age, it is reasonably certain that by 1970 we shall have to double the capacity of our present facilities in order to give higher education to all those who will seek it and have the capacity to benefit from it. This means that in the next 15 years we shall have to build in this country facilities for higher education equal to the total of all those built since the landing of the Pilgrims. This statement is probably correct even assuming the application of the presently indicated improved efficiency in the use of present facilities. Moreover, we will have to operate these added facilities and provide thousands more teachers for them. The question then emerges: can our colleges and universities expand to this extent, and still give the exceptional individual the opportunity for full individual development? I think they must.

President Eisenhower has frequently indicated the government's deep concern over this whole problem — which is really not a problem, but a great opportunity. In April of this year he announced plans to appoint a group of leading citizens to a Committee on Education Beyond the High School, under the chairmanship of Devereux Josephs, to give college and university problems the same scrutiny that the elementary and secondary schools received from the White House Conference on Education. This is an

(Continued on page 498)

Science and the Health of Mankind

SYMPOSIUM ADDRESS . . . BY HENRY VAN ZILE HYDE

T is the purpose of this morning's panel to examine the relation between science and the health of mankind, an area in which many distinguished graduates and teachers of M.I.T. have made important contributions. As a public health physician, I think particularly of William Thompson Sedgwick, whose name has become a part of our public health tradition.

Accomplishments in the field of health have been vast and profound. Infectious disease has been largely brought under control so that man is no longer destroyed by invisible organisms in great and unpredictable waves of terror. So great a change has necessarily had many by-effects. They are so revolutionary in character that man's relationship to his environment can never again be as it has been even in the recent past.

The changes that have occurred affect the quantity and quality of the world's population, the character of residual disease problems and the physical and social environment within which man lives and functions. By examining these effects, perhaps we may be able to see somewhat more clearly the direction in which science is moving today in the field of health and to gain some further understanding of the direction it should take in the future if it is to bring about a progressive improvement of man's relationship to his environment.

Throughout most of its brief history, New England has lived under a heavy pall of infectious disease. One need only visit New England's burial grounds to see the evidence of a grim story of premature death, attributed by the faith and science of early New England to a vengeful God and to mysterious miasmas engendered by swamps and filth.

The trek to the West, a century ago, spread throughout the country, in epidemic fashion, such diseases as cholera, smallpox, yellow fever, typhoid fever, diphtheria, scarlet fever, meningitis, and malaria. In the early part of the past century, Albany posted guards on the Erie Canal to intercept traffic that was suspected of bringing in cholera from upstate. Today these names stir only vague memories within us, but they struck terror again and again in the hearts of our parents and grandparents. Certain rather impressive figures give a measure of the change that has occurred. Between 1900 and 1954, the total annual death rate in the United States dropped from 17 deaths per 1,000 persons to nine per 1,000. And during this same period the same average life expectancy increased from 47.3 years to 69.6 years.

These accomplishments, however, are seen in their full significance only when viewed on the world stage. Malaria provides an excellent glass through which to view the change. A decade ago it was estimated that 300,000,000 persons contracted malaria each year. This figure has been essentially cut in half. Of the

600,000,000 persons living in formerly malarious areas, 260 million are now protected against the disease by DDT and other insecticides. Furthermore, there is presently under way, a co-ordinated international program directed at the eradication of malaria from the earth, as it already has been eradicated from this country and certain others. Tens of millions of persons who were formerly incapacitated by chills and fever for weeks out of each year, becoming progressively debilitated in mind and body as the years of recurrent sickness piled up, are now being released from such bondage to take their places as vigorous and productive workers.

Of essentially equal scope and significance are international programs aimed at the control of other chronic, infectious, and progressively debilitating diseases afflicting tens of millions of persons, such as yaws and schistosomiasis. During the past five years, under a joint program of the World Health Organization and the United Nations Children's Fund, 56,000,000 people have been tested for yaws. Of them, more than 8,000,000 infected have been treated with a single shot of penicillin, with miraculous cure. In Haiti, where more than 80 per cent of the population harbored the infection only five years ago, the incidence has been reduced to 0.03 per cent or less.

In general, statistics in the relatively under-developed areas are crude and unreliable but it is possible to estimate roughly what is taking place. According to the World Health Organization, death rates are 40 to 50 per cent - essentially one-half - the prewar rates in Cevlon, British Honduras, Chile, Singapore, and Costa Rica. In India, the death rate in 1952 was only two-thirds the annual prewar average. Since that year (1952) malaria has been brought under control in wide areas of India, where it has been responsible for 1,000,000 deaths per year, producing a further precipitous fall in the death rate. A dramatic example, probably unique in history, is the fall in death rate that occurred in one year in Ceylon, largely as a result of malaria control. The death rate there dropped from 20.3 per 1,000 in 1946 to 14.3 per 1,000 in 1947, a reduction in that single year of 20 per cent.

The dramatic decline in death rates has not been accompanied by an equivalent reduction in birth rates. Consequently, the world population is increasing by an estimated 40,000,000 persons per year. There is nothing in our experience or in our present understanding of the deep human drives involved that promises a substantial fall in birth rates in any way commensurate with the accomplishments in preventing death. We must certainly accept continued growth of the world's population as a working hypothesis for some years to come.

In addition to the quantitative change, changes have occurred in the structure of the population. The greatest gains in the prevention of deaths have been accomplished in the younger age groups, particularly in children. This, coupled with the maintenance of high birth rates, is increasing the number of dependents in the younger age groups, an increase in the United States amounting in the last decade to 25 per cent in the number of people under 20 years of age. Since we are no longer dying from infection in such large numbers, more of us are surviving into the later years. There has been an increase during the past decade of 30 per cent in persons 65 years and over in the United States and it is estimated that by 1975 there will be a further increase of 46 per cent in this group. The same trend is apparent in many other countries whose general growth and development have paralleled ours, and a similar change is just beginning to show itself in the less highly developed areas of the world.

What do these changes in population mean?

Quantitatively, man is placing a strain on the more readily available resources. Karachi, a fishing village a few years ago, is now the teeming capital of a great new country. As one looks out from Jinna's tomb one sees infinite reaches of squalid huts under the scorching sun in which man is crushed closely together in poverty. In Bengal, Iran, Egypt, and, indeed, much of Europe, man has far over-reached the local sources of food. At the same time, he is extending into primitive areas – into the jungle and the northern tundra - wherever there is ore or oil or power, encountering new dangers and new problems of adaptation.

Fortunately, as population has grown in numbers, man's vigor has increased as a result of the lifting of much of the crushing burden of disease. As in the case of malaria, other mass infectious diseases (such as hookworm, schistosomiasis, yaws, and trachoma, as well as the more familiar tuberculosis and venereal disease) are generally characterized by chronicity and reinfection and cause progressive physical and mental deterioration. A sick man is a consumer, whereas a well man can be a producer and indeed the greatest of all economic resources. It is estimated that up to 90,000,000 man-days of labor per year were released to the economy of Greece by the control of malaria and it is generally agreed that this additional healthy man power has played a major role in the postwar agricultural and economic resurgence of that country.

The world today is characterized by a dynamism that manifests itself in nationalistic drives and economic development, due in large measure to the fact that a rapidly expanding and vigorous world population knows for the first time, through modern communication, that mass disease and premature death, with their concomitants are no longer necessary.

Fortunately, again, the world still remains large and rich in relationship to its population. Although there are foci of great crowding, extensive areas remain in the Americas, Africa, and Australia and parts of Asia which require more, rather than fewer, people if they are to develop their full economic and social potential.

The changes in the world's population do not require us to throw up our hands in distress and despair but rather to re-examine our environment and our social structure. We must improve the utilization of

land and natural resources and at the same time develop new sources of power and new materials to meet the needs of increasing numbers of people. Concurrently, we need to study and improve methods of distribution, since man has outgrown localities, not the world itself. Thus, the physical and social sciences have a joint responsibility, becoming highly interdependent. Today's problems require a simultaneous frontal attack through the agricultural and health sciences, engineering, economics, sociology, and political science. Solar and atomic energy, hydroponics, and deionization of sea water suggest solutions in the physical area; recent strides in economic and social organization and action on an international plane suggest solutions in the social area. Accomplishments of the past in science and in man's readjustment to a changing environment leave no room for hopelessness or even pessimism concerning the future. It is significant and reassuring that India, where the problem is so great, is gaining ground through the planned and orderly development and use of its resources.

Having noted these great world issues, let us now look more specifically at disease itself. New concerns are taking the place formerly occupied by infectious disease. Among them are heart disease, cancer, mental and metabolic diseases, arthritis, and the allergies, a group loosely referred to, for want of a better collective term, as chronic diseases. Today, heart disease and cancer are the leading causes of death, with pneumonia, the old champ, trailing in sixth place. The gravity of the problem is suggested by the startling estimate that 40,000,000 persons of our present population will eventually suffer from cancer, and that 60 per cent of our hospital beds are today occu-

pied by patients with mental disease.

The chronic diseases and the aging process are characterized by changes in the cell. Therefore, the focus of attention has shifted from the living external agent to the molecular and submolecular structure and enzyme systems of the cell. The effort is to determine what the cell is, how it works, and how and why it changes its patterns of behavior with aging and under the influence of various stimuli. In its intensive and intimate study of the cell, science approaches the boundary between life and death. Quite suddenly we may gain new insights that will reveal the mysteries of chronic disease with as profound and dramatic results as have flowed from comprehension of the nature of infection. In fact, some believe that a key to the chronic disease is now almost within reach. When it is found - what then? There will be new problems arising from even greater population increase and further aging. The lengthening of life will be in the later and less productive years, rather than in the early years where such change has already occurred. New discoveries, therefore, can be expected to compound our present problems, giving them an increased urgency.

Rather perversely, perhaps, while science has been providing the tools for the conquest of infection, it has, at the same time, been creating new miasmas that are almost as mysterious as those of old New England and which constitute a new and growing danger.

The chemical discharges of thousands of industrial

475

plants and processes are creating a problem of water pollution of such extent that its abatement will cost the United States alone an estimated one billion dollars a year. Some 550 chemicals are added to food in order to preserve, color, and flavor it. More than 600,000,000 pounds of chemical insecticides are used annually in the United States in the cultivation of fruits and vegetables, exposing millions of workers and indeed all of us at our own dining tables. Some 1,700 tons of hydrocarbons are discharged into the air of Los Angeles each day. Voluntarily, we dose ourselves with huge amounts of inorganic chemicals for their physiological effect. Each year there are produced in the United States, almost entirely for domestic consumption, 399 tons of barbiturates, 34 tons of amphetamine – the pep-up drug – and 7,000 tons of aspirin - enough to make 19 billion five-grain tablets.

How dangerous is this chemical miasma? It is only possible to give suggestive answers. There appears to exist a possible direct relationship between trace metals and atherosclerosis, the vascular change which underlies coronary occlusion and high blood pressure. More than 300 different chemicals are known to produce malignancy in animals. Smog has killed in London and Donora, Pa. Barbiturates are a major cause of addiction. It can be hoped that study of the chemical determinants of cellular change will answer many of the questions regarding this new miasma.

Physicists as well as chemists are contributing to the contamination of the environment. Products of nuclear fission are being discharged into the atmosphere; isotopes are being widely used in research and therapy, and atomic wastes are accumulating on land and in the sea.

The engineer, too, is creating hazards in the physical environment. The automobile, insufficiently designed for safety and ever increasing in power, kills 40,000 Americans each year on inadequately engineered highways and emerges as the seventh cause of death in the United States. Accidents occurring in our homes cause 27,000 deaths per year and some 200,000 permanent disabilities. Science, thus, is building around us a physical as well as chemical environment that urgently requires fuller understanding. Meanwhile, the social environment is becoming progressively complex. The machines and institutions which have been created to increase production and facilitate distribution have placed new stresses upon



us. The peasant, for instance, no longer sustains himself and family alone. In increasing numbers, he is joining co-operatives, driving tractors and automobiles, investing money, and educating his children so that they may better compete in the new social environment.

In contrast to our own step-wise progression, changes in the underdeveloped areas are often sudden and complete, transferred in full bloom from one area to another. Tradition, customs, tabus, and even faith are swept aside by the irresistible assault of progress. A small airplane recently landed in a town in the Himalayas where the wheel was unknown. A flying saucer from Mars landing on the M.I.T. campus could cause no greater shock or problem of adjust-

Whatever our age may be dubbed in the future, we can recognize it as one of rapid change, progressive complexity, and thundering activity - as a strenuous race between man's social flexibility, moral integrity, and technical ingenuity.

Man must learn to live with man in this rush of progress. Otherwise he will break under the strain and may, in fact, ravage or destroy his own universe. This threat calls major attention to the psychological, cultural, and political interrelationships that shape man's destiny. The social sciences, buttressed by new and more intimate knowledge of the internal processes within man – how the brain cell works and how it relates itself to other brain cells, for instance - can show us the way to adjust these forces to man's ability to absorb them with equanimity. Because of the extent and rapidity of the changes that are occurring, we often become somewhat impatient with the social sciences. Perhaps new concepts and new instruments, such as electronic calculators, will make it possible for the social sciences to handle with exactness the infinite number of variables with which they must deal, showing the way to new patterns of life that will help man adjust to the new environment.

These changes that we have looked at - population, disease, and environment - have suggested certain directions in which science must move if it is to solve the problems which it has created. It must strike out in new ways, develop new methodologies and knock down the traditional barriers between rigid and arbitrary categories of scientific specialization. Progress cannot be achieved at an optimum rate unless there is an interdependent, interdisciplinary attack on these critical problems.

The Public Health Service recently opened a Clinical Center at the National Institutes of Health in Bethesda, Md. In this modern facility, 500 hospital beds devoted to research purposes are surrounded by 1,000 laboratories for both clinical investigation and basic studies. Structures of this kind symbolize the highly integrated nature of today's and tomorrow's medical research. Similarly, space is being

(Continued on page 526)

Speakers at the symposium on Alumni Day included (left to right): Francis O. Schmitt, Institute Professor of Biology, Dr. James M. Faulkner, Medical Director at M.I.T., who served as moderator in the unavoidable absence of Dr. Egon E. Kattwinkel, '23, and Dr. H. van Zile Hyde.

Sanitary Engineering and Man's Health

SYMPOSIUM ADDRESS . . . BY GORDON M. FAIR

ANITARY engineering, as I had occasion to remark at the celebration of the one-hundredth anniversary of the founding of the Boston Society of Civil Engineers, is as Bostonian in its origins as baked beans and brown bread. Although the evolution of sanitary thought, and with it of sanitary science, is cosmopolitan and ageless, incorporation of the principles of sanitary science into an engineering discipline toward the end of the nineteenth century and inclusion of sanitary engineering in the armamentarium of public health were accomplished first in Boston and, as we shall see, in no small measure at the Institute.

Entrance of the Engineer into Public Health

The story of the entrance of engineers into public health is a twice-told tale, but it is worth retelling, especially in the halls of this Institute. The story begins with the passage in 1886, by the General Court of the Commonwealth of Massachusetts, of "An Act to Protect the Purity of Inland Waters." This Act was designed to safeguard the waters of the state against mounting pollution by municipal and industrial wastes.

To carry out the provisions of this Act, the State Board of Health, under the promptings of its engineer member, Hiram F. Mills, created an engineering department, the first specialized department of its kind, and for that matter the first specialized public health administrative unit of any kind. Along with the development of an engineering staff, the Act to Protect the Purity of Inland Waters made funds available for the systematic analysis of water. This permitted drawing into close association with the engineers a notable group of chemists and biologists, some of whom, like William Thompson Sedgwick and Thomas M. Drown, were on the faculty of M.I.T., in whose laboratories the analytical work was performed for ten years before a laboratory was constructed in the State House. The close collaboration of Hiram Mills, a research-minded hydraulic engineer, and of the M.I.T. scientists was responsible also for the development by the engineering department of the State Board of Health of a laboratory for sanitary research - the Lawrence Experiment Station - where fundamental investigations of the purification of water and waste water and other sanitary researches were soon in progress.

To staff this research station, Mills drew heavily on young graduates of M.I.T. who were thus led into sanitary engineering through research and who later continued to pursue the scientific method in the practice of engineering which they entered after successful careers at the Lawrence Experiment Station. The names of Allen Hazen, '88, and George W. Fuller, '90, are associated directly with the studies of the

Experiment Station. However, there are others, too, who in one way or another were part of the pioneering group, among them George C. Whipple, '89, Charles-Edward A. Winslow, '98, and Earle B. Phelps, '99. These men eventually became eminent as professors at Harvard, Yale, and Columbia, respectively.

Fortunately, the union of scientific research and engineering practice and the alliance of engineers with physicians, chemists, and biologists, which began in Boston seventy years ago and eventually created the profession of sanitary engineering, have never been dissolved, and sanitary engineers have continued to put to use those discoveries of medicine, engineering, chemistry, and biology which make for the advancement of man's health through the control of his environment.

However, lest there be misunderstanding of the accomplishments of sanitary engineering, may I point out that one cannot give credit for an improving environment to sanitary engineers alone, nor, for that matter, to the teams of engineers, medical men, and scientists that have been most immediately concerned with the implementation of programs for sanitary reform. There have been many workers in the vinevard. As Lemuel Shattuck, the father of public health in the United States, stated in his monumental Report of a General Plan for the Promotion of Public and Personal Health, "the promotion of public health is a matter which concerns every profession and every person." The wide representation of speakers at this symposium on Science and the Health of Mankind gives emphasis to this statement of more than a hundred years ago.

Essentials of Human Existence

The essentials of human existence amenable to control by engineers are four in number: air, water, food, and shelter; the air we breathe, the water we drink, the food we eat, and the shelter that protects us from the elements. It is with these fundamental needs of mankind that sanitary engineering is concerned. The spectrum of needs ranges from those of the most primitive to those of the most highly developed cultures. Every age, every clime, every condition of man presents its own problems. For some a solution is found in obedience to the simplest of Mosaic laws. For others the latest discoveries of nuclear physics must be adduced to find an answer.

Water — A Human Essential

As indicated at the beginning of my address, the collaboration of engineers with medical men as well as with chemists and biologists was born of the needs of a developing industrial civilization to preserve the integrity of its water resources. Engineering control

had to be exerted in three directions: the provision of safe, adequate, and economical water supplies; the utilization of these supplies to carry away, without danger or nuisance, the wastes of household and industry; and the preservation of natural waters for the wider use and enjoyment of man.

Although the immediate impact of water upon human health is our concern at this conference, it should be said that the availability of adequate amounts of clean water has contributed immeasurably also to the general comfort and well-being of mankind. Water works and waste-water works are essential elements of the social capital that makes for an advanced state of living or civilization.

Historically the first, and perhaps the foremost, contribution of sanitary engineering to the health of mankind has been the control of water-borne enteric infections. At the turn of the last century, typhoid fever was still rampant in many of the cities of the civilized world. Since then, water purification - including, in particular, water chlorination - together with proper construction and maintenance of distribution systems have reduced this disease to the vanishing point. However, the epidemic of 1955-56 in New Delhi, India, of the virus disease, infectious hepatitis, which was not accompanied by other enteric infections, may imply that the conquest of water-borne bacterial diseases through currently practiced methods of water purification does not necessarily signal the conquest, too, of viral diseases that may be water-borne. Indeed, much scientific work needs to be done before we can assure ourselves against the recurrence of similar outbreaks of virus diseases. That typhoid fever and other enteric infections are still among the important causes of death in the underdeveloped areas of the world speaks for an economic as well as hygienic approach to water needs.

Physiologically Active Chemicals

Water sanitation does not stop with the prevention of enteric infections. Within our generation attention has been drawn to the relation of minute amounts of chemical substances to the health of the water consumer. Experience has shown, for example, that excessive amounts of fluoride ions in water are responsible for the presence of endemic dental fluorosis or mottling of the enamel of the teeth and that inadequate amounts of fluoride are associated with a high rate of dental caries. We have learned, therefore, that both bad and good can come from fluoride ions in water. For proper balance, excessive amounts of fluoride are, therefore, being removed from some water supplies and inadequate concentrations of fluoride are being supplemented in other supplies. Although a lack of traces of iodine in water is associated with endemic goiter, it is more economical to include needed iodine in table salt rather than to add it to the public water supply. One of the most recent discoveries of the physiological activity of small amounts of chemical substances in water has been the observation that bottle-fed infants may suffer from cyanosis (methemoglobinemia) when the formula water contains excessive amounts of nitrate, a normal end product of nitrogen stabilization in natural waters. The use of radioactive isotopes in scientific laboratories, hospitals, and industries, radioactive fall-out from nuclear weapons tests, water-borne waste products from nuclear installations, and waste waters from nuclear power plants are introducing increasing amounts of radioactivity into our water supplies. Existing health and pollution-control agencies are being given the responsibility for keeping the radioactivity of water within safe bounds, and the sanitary engineer is learning how to deal effectively with these new hazards to health. At the same time he is finding radioactive tracers useful in his own studies of water purification and in hydraulic and related experimentation.

The desalting of saline waters is engaging the attention of scientists in wide measure today. Water is in short supply in many regions of the world. The shortage is felt in heavily industrialized areas on the one hand and, on the other, in the arid lands that are being opened up for resettlement of displaced peoples and for the exploitation of a variety of natu-

ral resources.

The vast storehouse of water in the ocean is tapped normally only through the interposition of the natural hydrological cycle. Through it, moisture evaporated from ocean surfaces is precipitated upon the land. Among new discoveries in the recapture of fresh water from salt are increasingly more efficient evaporators (including vapor-compression units), new ion exchange resins, and ion-selective semi-permeable membranes. The harnessing of solar energy may have to be awaited before sea water itself can be economically transformed back into fresh water. Man may indeed be forced to induce a manageable hydrological cycle in order to separate water from contaminating salts, organic matter, and living organisms on a regional scale.

Most of the water supplied to modern communities must be removed as spent or waste water. That these Augean streams may not destroy the lakes, ponds, and rivers or the tidal estuaries into which most of them must empty, treatment works of ever-increasing effectiveness have been built to make the waste waters safe for disposal. What has been done for municipal sewage has been repeated in ever-increasing volume for industrial waste waters, too.

In the competition for water, the needs of industry and agriculture far exceed the demands of municipalities and rural settlements. In particular, the growth of the chemical industries that are heavy water consumers and waste producers makes it imperative that waste-water treatment be considered an integral part of the manufacturing process, and that the sciences which provide us with new and useful products find a solution for concomitant problems of waste-water disposal.

In the absence of water-carriage of waste matters, human excreta must be disposed of in privies and similar structures. In rural areas of highly developed countries and throughout the underdeveloped regions of the world, however, suitable methods of excreta disposal have often failed to be established. Then there has been a spread of a wide number of

(Continued on page 520)

Food and Agriculture and Man's Health

SYMPOSIUM ADDRESS . . . BY J. GEORGE HARRAR

THE health of mankind is clearly dependent on adequate quantities of suitable foodstuffs to sustain life. In global terms this means that today the 2.4 billion acres of land under cultivation should provide nearly 3,000 calories daily for a world population of approximately 2.6 billion individuals. And population increases of from one to two percent per year must be balanced by comparable increases in agricultural production if minimal health requirements are to be maintained. It has been estimated that land now under cultivation could support two to four times the present world population if available knowledge could be generally applied. Therefore, if these favorable estimates are even approximately accurate, an adequate dietary standard for all the world in the foreseeable future depends on scientific ad-

vances and social progress.

The invention of agriculture was the basic factor in permitting the establishment of stable populations, which in turn enabled society to develop local patterns of education, art, science, and industry, leading to the present day political and cultural organization of the world community. Since the development of modern agricultural science coincides with a greatly accelerated population increase, primary emphasis has necessarily been on the quantitative aspects of food production. This increase in the numbers of individuals, both human and plant and animal, has intensified the problems of public health and created, at the same time, serious "public health problems" of crop plants and domestic animals. Urbanization and the mechanical crowding of society which contribute so importantly to the development of communicable disease, have dramatic parallels in crop production. When 3,500,000 nearly identical individual wheat plants are planted on a single acre the possibilities for epiphytotic outbreaks of plant disease are extremely favorable.

The world has accepted approximately a dozen of the 200,000 described species of plants as principal sources of bulk and protective food. Of these, the grass family provides the largest share of the world's food calories in the form of rice, corn, wheat, sorghum, sugar cane, barley, millet, and forage grasses. Other major crops are the potato, sweet potato, banana, coconut, bean, and cassava. Most of the remainder of the world's food supply is derived from cucurbits, crucifers, tree and small fruits, and miscellaneous vegetables. Although they, too, are dependent upon plants, livestock, poultry, and fish provide from ten to fifteen per cent of the approximately 900 million metric tons of foodstuffs currently required

by society each year.

Over the years tremen

Over the years tremendous progress has been made in improving the yield of agricultural products. During the past 50 years alone, potato production has climbed from an average of 19.8 bushels per acre to 253.4, with a record of 1,180 bushels (California):

corn from 26.6 to 42.5 with a record of 304.8 (Mississippi); wheat 14 to 19.5 with a record of 125 (England; and rice from 28 to 60.6 with a record of 400 (Australia). It is both striking and comforting to note that although average yields of crop plants have increased from 50 to 200 per cent during the past 50 years, potential increases of several hundred per cent of present averages can be obtained under optimum conditions. On the animal side, average yields of eggs and milk have increased. Milk production is 45 per cent greater than 40 years ago; and egg production is 50 per cent greater than it was ten years ago. Modern meat animals dress out 20 to 50 per cent higher than 50 years ago, and these added quantities of human foods are produced in less time and with less expense than formerly. Moreover, improvements have been made in the quality of essentially all of the basic food crops and animals so that they supply greater quantities of the key elements for human nutrition than their prototypes.

Agricultural Advances in Support of Health

Current advances in agriculture are the product of the combined efforts of agricultural scientists, engineers, chemists, and biologists. Other notable results will certainly come about from: (1) proper land management, (2) developments in farm machinery, (3) control of disease, pests, and weeds, (4) genetic improvements of food crops and animals, and (5) increased use of agricultural chemicals.

Land Management

Modern advances in soil and crop management include ingenious systems of rotation, irrigation, fertilization, and cultivation which greatly enhance the average productivity of various classes of agricultural soils. Efforts to obtain the optimum balance between crop and available water and nutrients have been increasingly successful and have led to the aforementioned record yields. In the future, deeper understanding of soils as living media essential to the support of plant and animal life should permit dramatic increases in production. Soil conditioners offer possibilities for improvement in soil texture and structure, and compounds which influence the activity of soil microflora and fauna will take advantage of this enormous biotic resource for greater food production.

Like industry, modern farm practice requires such diverse knowledge, skills, and equipment that, for reasons of efficiency, farms must become larger or highly specialized in the future. In the latter case, increased knowledge and improved aids to agricultural practice may well convert the present system of crop diversification and rotation into one of balanced monoculture. Moreover, the future trend in the management of livestock and poultry will be more toward a production-line system under which conditions are carefully controlled. The use of increasingly valuable

crop land by relatively small numbers of animals will probably decrease in the face of the growing demand for food, with the result that methods of *in situ* production of food animals may become commonplace.

Inevitably some increase will occur in the total area of land under cultivation as a response to growing population pressures. Some land can be recovered from saline and eroded areas and the drainage of inundated regions. Progress can certainly be made in the conversion of semi-arid and arid lands to agricultural production and in the extension of agriculture more widely into the humid tropics where lateritic soils predominate as well as in the cool humid regions typified by podsols. This will depend to a large extent on the conservation and efficient utilization of available water, the degree to which natural rainfall can be influenced, the conversion of salt water to sweet or semisweet water to supplement irrigation requirements (which are 88 billion gallons daily in the United States), and the increased use of solar and nuclear energy in agriculture. The most optimistic estimates indicate that something less than one billion acres of additional land might be brought under cultivation. These estimates do not, however, take into consideration the losses of present land under cultivation through mismanagement, flooding, and increased urbanization.

There is considerable evidence that approximately one per cent of the world's food which now comes from the sea will be increased several fold through new methods of harvesting existing marine forms and the improvement of species through hybridization.

Developments in Farm Machinery

A host of new types of machines has become available in response to the growing needs of agricultural producers. These include both tractor-drawn and self-propelled equipment for soil manipulation, planting, cultivating, spraying, and dusting, and harvesting, as well as airborne equipment for seeding, weed control, and disease and pest control. One of the great bottlenecks in the past has been insufficient labor at harvest time, but this situation is being met with such machines as cotton, corn and hops pickers, cane harvesters, and modern combines.

The percentage of the United States' labor force devoted to agriculture during the past 150 years has dropped from 75 to 10, and today each farmer feeds 18 other people rather than seven as in 1925. Future progress can be expected in the development of machines for harvesting tree crops and other products not readily handled by presently available equipment. And it may also be that one or more stages in the processing of crops may be carried out in the field at the time of harvest, with corresponding improvement in quality and reduction of losses which may occur between the field and the factory.

Disease, Pest, and Weed Control

The traditional practice of applying excessive quantities of fungicides and pesticides to crops is both crude and wasteful. Modern spray materials and dusts are more effective and more economical than those used in the past and are applied in smaller quantities. However, we still make external applications to compounds containing phosphorus, zinc, copper, mercury, sulfur, and other elements for the control of fungi, bacteria, and insects attacking crop plants. Ultimately more precise methods should replace most of the current practices, and there is already evidence that certain organic compounds can function as systemic protectants against certain pests and diseases. Eventually it should be possible to introduce systemic chemicals into plants through normal absorption and translocation pathways or through epidermal tissues and external openings. This could be accomplished in connection with the standard practices of soil preparation or the compounds might be placed on seed before planting in the form of chemical dusts or slurries.

Naturally occurring antibiotic compounds offer great promise as systemic protectants. Probably many commonly occur in the soil and have important roles in controlling the numbers and distribution of soilborne microorganisms, both pathogenic and non-pathogenic. As these and other antibiotic products of metabolism and microorganisms are better understood they may well provide materials for the more effective control of many of the pests and pathogens responsible for much of the more than five billion dollar loss of agricultural products which now occurs each year.

Genetic Improvement of Food Crops and Animals

Modern advances in genetics have resulted in the use of techniques of pure line selection, inbreeding, backcrossing, and recombinations resulting in hybrid vigor. This phenomenon has provided record yields of cereals, poultry, and other foods, and has opened new avenues of investigation directed toward the greater utilization of combinations of germ plasm for increased production. We can anticipate that chemical and physical aids will induce combinations of genes presently considered to be impossible. This would permit the blending of widely divergent characters with commensurate improvements in production. Although induced genetic aberrations such as polyploidy have resulted in larger and more productive plants, it is probable that in years to come crop plants may be largely efficient perennial dwarf hybrids producing maximum quantities of fruits, seeds, tubers, and so forth, per foliage unit. Similarly, domestic animals can be expected to undergo further improvement in ratios of milk, eggs, and meat production to non-edible by-products.

Agricultural Chemicals

Considerable progress has already been made, not only in the use of chemical fertilizers, protectants, and herbicides, but also in the synthesis of compounds which advantageously affect growth rhythms of domestic plants and animals. It is now possible to influence certain growth phenomena such as abscission, rooting, and sprouting, with natural and syn
(Continued on page 508)

Biological Sciences and Man's Health

SYMPOSIUM ADDRESS . . . BY FRANCIS O. SCHMITT

T is my assignment in this conference on "Science and the Health of Mankind" to discuss the role of basic biological research in the general health program. I propose to do so by considering three aspects: (1) the subject matter dealt with in modern biological research; (2) some highly significant fields of biological investigation as they bear on the subject under discussion; and (3) some possible developments of great importance in the future.

As has been pointed out by other speakers this morning, the nature of the health program, at least in this country, has been enormously changed in the last few decades by the widespread use of antibiotics, vaccines, and other preparations capable of controlling and preventing the growth of microorganisms and viruses. This has shifted the emphasis in medical research from the infectious diseases to the chronic, degenerative diseases such as cancer, cardiovascular, mental, and rheumatoid diseases and the process of aging itself. Because so many infectious diseases are now under control some have almost completely disappeared – the average age or life expectancy has risen considerably. There is a much larger fraction of our population in the 60 to 80 year age group than was the case a generation ago. Consequently much more consideration is being given to the diseases which affect the aging organism and to the process of aging itself. The latter process, widely supposed to be due to a wearing out of the machine, may, in fact, be due to active processes which, after a certain length of time, may cause the vital functions of the body to be disrupted. Obviously, the discovery of the nature of such processes and the investigation of their causes and possible control (constituting the field of gerontology) stand high on the priority list of the health program.

In most cases the degenerative diseases involve alterations (sometimes taking years to manifest themselves) in the structure and chemical metabolism of the cells of the various tissues. It is this fact which makes these diseases so difficult to deal with in the decisive manner with which the infectious diseases are now handled. To correct and prevent deviations from normal we must first understand what constitutes the normal pattern. In this regard, medicine is somewhat in the predicament of the expert mechanical engineer who was given the task of fixing a complicated mechanical device of a kind never before seen by the engineer. Although thoroughly familiar with the basic principles underlying modern mechanical engineering, this individual had perforce to take the machine apart and study the structure of the individual components and the ways in which these components interacted with each other, making possible the smooth operation of the machine as a whole. So in the health program we can hardly expect to repair the ailing human machine until the structure and function of the normal body is better understood. Some efforts are currently being made in the field of chemotherapy to discover drugs or chemical compounds which will be helpful in diseases such as cancer. Compounds known to be important in one or another aspect of chemical metabolism, or substances chemically related to such compounds, are being tested on animals on a fairly large scale. Although such empirical tests are of value and might conceivably lead to the discovery of a chemical "magic bullet" against one or another disease, we must rely for the long haul upon the slow advance of the biomedical sciences. But the study of the normal cell and organism is the province of biology. Hence the growing emphasis in our times upon biology as basic to the health of mankind.

The Scope of Modern Analytical Biology

At this point it may be well to correct a common misconception concerning the content and current practices in the field called biology. Properly defined as the science of life and living organisms, biology embraces not only the study of natural history and the structure and behavior of the various kinds of plants and animals in their natural habitats but also the detailed structure and chemical reactions which characterize the protoplasm of cells and tissues. Being himself a member of the animal population, man is keenly interested in the findings of biological scientists.

Because of their role in the testing of the theory of organic evolution, the study of taxonomy, comparative anatomy and embryology were heavily stressed in the early decades of this century. However, the dust of this battle has fairly well settled. The armies have moved on to new scientific battlefields - chiefly those of cell physiology and the various biological applications of mathematics, physics, and chemistry. I do not mean to imply that the more descriptive aspects of biology have lost their scientific importance. Far from it, as will be brought out when we consider the possible shape of things to come. However, many biologists, particularly many secondary school teachers, but also some professionals in colleges and universities, are fighting upon battlefields which have long since lost their armies.

Little wonder that the active, inquiring minds of young students growing up under the instruction of teachers whose intellectual horizons are those of at least one generation ago have turned to other fields of science and engineering as a test of their mental prowess and as a professional field to which to devote their life's work.

In an age which bristles with challenges and opportunities for scientific adventure and for service to mankind the life sciences are being widely deserted by the ablest students in the high schools and colleges. This recruitment problem is causing growing anxiety to those concerned with the health program

as well as to professional teachers and investigators in biology. At a time when funds for research in basic biological science are being provided by agencies of the federal government, by voluntary health organizations, and other foundations in amounts which seem to be growing almost exponentially over the last decade, investigators frequently seek in vain for well-trained personnel to help them carry out their research programs.

What's in a name? One sometimes wonders whether it might not help to introduce terms other than biology. Especially in the secondary schools, if students have come to associate this term with a field which has long since lost its thrill and which offers little financial and professional reward to those who choose it for their careers, a new term would be useful. The field is really that of the "life sciences" and I sometimes think we should use this term more frequently. Another useful term is "molecular biology." Much of the current interest is focused at the molecular and submolecular levels and, at this level, the distinctions between physics, chemistry, and biology tend to disappear.

In my discussion today my theme will be that we must emphasize the analytical approach to the study of cell physiology, using and applying all of the recent advances in physics, chemistry, and technology. It is clearly upon this approach that we must rely if significant advances are to be made in the critical fields of the degenerative diseases. It is this approach which has been strongly emphasized in the teaching and research programs of the Institute's Department of Biology. In the applications of biophysics and biochemistry to the study of cell physiology, the Institute's program offers great challenge and opportunity to prospective students at the undergraduate levels, not only because of its significance in the over-all health program but also in the extension of the scope of theoretical biology.

The Molecular Machinery of the Cell

The desirability of obtaining detailed knowledge about the molecular fabrics which make up the machinery of tissues is obvious. This might be illustrated by considering a modern jet airplane. Viewed externally the plane seems extremely simple to the layman. It is difficult to see what provides the power, speed, and flight properties manifested by the plane. But when one lifts the hood and examines the jet engine, he finds a very complex mechanism indeed. To understand the functioning of the jet engine and the properties which permit the plane to fly as it does, the lay person would have to take the engine and the plane apart, discover how each portion functions and interacts with other structures to constitute a flying machine. Yet the mechanism of a jet engine is simple indeed when compared with the complexities of the living cell. The latter also seems deceptively simple when examined with the lower powers of the light microscope.

Until recently it has been possible with the light microscope to resolve objects no smaller than about two-tenths of a micron (about 1/100,000 inch) — a size enormous compared even with biological molecules.

With the development of the electron microscope, and its application to the study of the structure of biological materials, in the last 20 years it has been possible to observe directly not merely the smallest details of cell structure but even the molecules themselves. The present day electron microscope has an intrinsic resolving power entirely adequate to the job: from about 5 to 10 Angstrom units, or roughly 1/50,000,000 inch. This permits the biologist to put on molecular spectacles, as it were, and explore the new domain of the submicroscopic structure of protoplasm. This is indeed biology at the molecular level.

One of the techniques which has been of very great value in these recent advances is that of ultramicrotomy, or the cutting of biological material into sections so thin as to permit its study with the highest

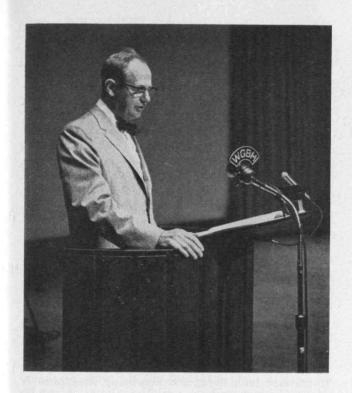
powers of the electron microscope.

Among the types of protoplasmic structure which have been observed in thin sections, and which are of the greatest biological importance, are thin lamellar, membranous structures. The outer cell membrane is such a structure. Since it regulates the molecular traffic into and out of the cell, the investigation of its ultimate molecular composition is of great importance. It has also been discovered recently that in cells manifesting high metabolic activity, as in active secretion, a system of very thin membranes is formed which almost fills the protoplasm. These are thought to be concerned with biosynthetic processes. They apparently provide the additional floor space needed when the cellular factory has to fabricate biological materials. Such a layered structure has also been found to characterize the granular particles, called mitochondria, which are found in almost all cells and which are the power plants of the cell. That is, the mitochondria produce substances (such as adenosine triphosphate or ATP) which furnish the available free energy to drive the molecular machinery of the cell. If we could actually discern the individual enzyme machines which are mounted upon the floor space provided by this layered system, it is possible that we would discover a production line which would make our most modern mass producing factories seem simple and crude! It is by this almost inconceivably complex and specific organization of the molecular machinery of the cell that the very high efficiency and adaptive versatility characteristic of living systems is made possible.

Another structural idiom adopted by cells, in addition to the two-dimensional, layered system, is that of parallel, long, thin rods, or macromolecules, which compose the various fibrous structures. In the form of muscle, tendon, skin, bone, hair, chromosomes, and the intracellular cytoskeletons which give cells their shapes, we have the mechanical effectors of the organism. Because of the specific distribution of the chemical groupings along these thread-like macromolecules, they aggregate or polymerize linearly and interact with each other laterally to form mechanical structures which subserve such fundamental processes as the contraction of muscles (of which the heart is an example), the division of cells, the specific segregation of chromosomes in the formation of germ cells

and body cells, and so on.

(Continued on page 504)



Physical Sciences

and

Man's Health

SYMPOSIUM ADDRESS

BY JOHN G. TRUMP

John G. Trump, '33, Professor of Electrical Engineering at M.I.T., speaks on means by which the physical sciences contribute to man's health, in the Kresge Auditorium.

AM grateful to the previous speakers for their many impressive references to the effect of the L physical sciences on the promotion of human health. Let me approach this subject by reconstructing two incidents from the ancient and the past.

The year, let us imagine, is 400 B.C. Andromachi, who lived on the street of the weavers, had at last consented to send for the physician – Hippocrates. Unlike the priests who dispensed their medicines and incantations to the crowds from the temples, Hippocrates came to the home of the sick one accompanied by a single student. Opening the shutter to the afternoon sun his keen eyes took in quickly the telltale signs. Had he not, only last spring, at the time of the festival of flowers, spent long hours recording the variety, the salient features, the unfavorable prognosis presented by this implacable disease with its crablike tentacles. More than 2,000 years later, this disease would still be an urgent human problem, and this passage among the medical writings in the Corpus Hippocraticum would still be extolled as a model of its exact clinical description.

Andromachi's days were clearly numbered. Hippocrates knew the relentless extension of this malady was immune to the accumulated medical skill of Egypt, India, and Greece. Nevertheless, his examination was careful; when he spoke, his voice was comforting. The herbs he left behind and the foods, fresh air, and sun which he prescribed would support and encourage. Andromachi felt benefited; more at peace

than she had been for months.

The scene shifts. It is the late afternoon of November 8, 1895. A bearded and little known professor of physics at the German University of Wurzburg, Wilhelm Konrad Röntgen, is working alone in a darkened laboratory. The pear-shaped glass tube has been carefully covered with cardboard and metal foil, shutting in the light produced by the passage of the high voltage discharge through the rarified gas. Would the rays from the negative electrode - the cathode rays be able to emerge from this heavy-walled Crookes tube? Not likely - even with the thin aluminum window of the Lenard tube the cathode rays could penetrate only a few centimeters into air. Some distance away on the table lay the barium-platinocyanide paper which Röntgen would later bring near. Its fluorescence under cathode ray bombardment, or lack of it, would answer this question.

To confirm again the light-tightness of the covering, Röntgen passed a series of electrical discharges through the tube. Suddenly, in the darkness, he noted a faint vellow-greenish fluorescence shimmering near the table. Röntgen lit a match. To his surprise it was the little barium-platinocyanide screen. Highly excited, he repeated the experiment again and again. Soon there was no doubt of it - rays capable of passing through opaque matter and through many feet of air were coming from the tube. The x-rays thus discovered have since, through the efforts of many investigators - von Laue, Rutherford, the Braggs, A. H. Compton, and others - greatly advanced man's knowledge of the structure of matter, of molecules, and of atoms; they have proved a boon to medicine both in diagnosis and therapy. Indeed, this observation of Röntgen's is regarded by many as the historic beginning of the present atomic age.

Today, 24 centuries after Hippocrates, the physician still comes, in effect, to the patient. But they can now approach each other by foot, by auto, by railroad, by ship, and by aircraft. The physician's keeneved search for telltale symptoms is still his primary diagnostic reliance but today the eye is assisted, when appropriate, by glasses, by simple microscopes, by compound microscopes using ultra-violet light capable of enlarging minute cellular structures and microorganisms up to 10,000 diameters, or by elec-

483 JULY, 1956

tron microscopes using streams of cathode rays by which this enlargement may be extended to 100,000 diameters and more. He still listens to the sounds of the heart and the chest, but his ears are now assisted by physical and electronic devices – the stethoscope, the audio-amplifier, and the electrocardiograph. He still talks with reassuring human words with his patient and his student but his voice is now able to communicate almost instantly with millions of people. to span countries and oceans, to be stored, printed, reproduced, and amplified. He still relies on visual and tactile examination but he can now also discern internal anatomical structures by x-rays, analyze and modify molecular structures of medical value by infra-red and ultra-violet spectroscopy, identify tissue by biopsy and microscopic study, and trace the course of blood, lymph, and secretions by selectively absorbed chemicals or by following the progress of microcurie amounts of radioactive material.

Like Hippocrates, the modern physician still regards himself as merely an assistant of beneficent nature. The simple warmth, rest, and food available to the ancients are still indispensible for recovery but these have now been tremendously augmented. The electro-magnetic spectrum — once limited to the narrow band of visible light from the sun and the near infra-red of fire and hot bodies - has now been extended to wavelengths a million times shorter than the shortest visible ray on the one hand and a million times longer than the longest infra-red on the other. In this broadened spectrum are a hundred diagnostic, therapeutic, and research aids. To the materials of the macroscopic world are now added the sub-microscopic particles of the atomic world, the fundamental particles of matter – electrons, protons, deuterons, alphas, neutrons - are now available in copious amounts and controllable in energy and direction. These, too, are destined to contribute to the health and welfare of man.

We have heard this morning the dramatic story of the prevention and control of infectious diseases. Ahead lies a long struggle against the degenerative and neoplastic diseases. The lines of this struggle are widely drawn; they take in all the advanced countries of the world linked together by the bonds of modern communication and transportation. They extend from laboratories of fundamental physical and biological research through an array of more directed activities up to the bedside observations of the clinician. It is hardly surprising that this work should touch, in more places than I can briefly mention, the educational and research activities at M.I.T. The medical contributions of physics, chemistry, metallurgy, and engineering have come along in a steadily increasing stream. They include improved understanding of the basic structure of matter, of molecules, of proteins, and other constituents of the living cell; they include the physical and biological effects of ultra-violet light, the instrumentation of medicine with such electronic and medical devices as the electroencephalograph, the D-C amplifier, and the Hardy recording spectrophometer. They have dealt with the chemistry and synthesis of vitamins, low temperature physics and engineering, the preservation of foods, and the physics and applications of x-rays, and radio-activity.

In this atomic era it is not inappropriate to select some relevant examples: Some years ago the pioneering work of the M.I.T. cyclotron made available radioisotopes for the study of the preservation of blood and other tracer studies; more recently it has produced radio-arsenic used in a new technique for the location of brain tumors. It is hoped and expected that the Institute's proposed research reactor will produce a variety of short-lived isotopes and streams of neutrons of medical value. One proposed application of such a reactor is the therapy of brain tumors. Ordinary boron 10, injected into the patient, is selectively absorbed by the tumor; the involved region is then irradiated with slow neutrons emerging from a portal in the reactor wall. The high collision crosssection presented by boron to slow neutrons results in the direct alpha particle irradiation of the tumor.

Our own activities with streams of electrons and x-rays from an electrostatic accelerator, originated by Van de Graaff for precision studies on the atomic nucleus, is a natural extension of Röntgen's experiments 60 years ago. Electrons from the cathode, accelerated by several millions of volts, can now be projected through many feet of air and can be caused to traverse both living and non-living structures. A stream of three million volt electrons, for example, will penetrate through 40 feet of air or nearly an inch of water or tissue-like material. Within this range it excites and ionizes the atoms setting off a chain of chemical and biological reactions, many of which are of considerable practical and medical value.

Such streams of high energy electrons are an efficient means of destroying unwanted microorganisms bacteria, viruses, spores, and molds – and engender very little heat in accomplishing their sterilizing action. Even high concentrations of the most resistant organisms require an electron dose of less than three million rep units. This amount of absorbed energy would raise the temperature of water about six degree Centigrade. Naturally, this prospect of "cold sterilization" has led to the investigation of the sterilization of injectable pharmaceuticals which are usually heat sensitive and therefore difficult to free of organisms by conventional methods. During the past five years, many types of sterile products, including the antibiotics, the adrenocortico extracts, surgical sutures, ointments, absorbable sponges, vaccines, and a host of other items have been sterilized by electrons in the research laboratory usually without loss of potency or adverse effects.

For some years, in cooperation with the U.S. Public Health Service and several biological and medical laboratories, M.I.T. has worked on the inactivation by electrons of the hepatitis virus which occasionally contaminates blood plasma and to a lesser extent, whole blood. It is this virus from which Dean George Harrison is now recovering and which therefore accounts for my participation in this morning's program in his place. In military medicine the growing incidence of hepatitis virus usually contributed unwittingly by a human donor and distributed throughout a considerable volume of pooled plasma, is a serious problem. This organism can be demonstrated only on man. In order to determine the inactivating electron

(Continued on page 532)

A Report on

Progress at M.I.T.

ALUMNI DAY ADDRESS . . . BY JAMES R. KILLIAN, JR.

Today I have the honor to present my eighth annual Alumni Day report on M.I.T. affairs. In presenting it, I am prompted by sentiments reflecting a long parade of years, this being the year of my thirtieth reunion and the thirtieth since I started to work at M.I.T.

No one can live and work at this institution for 30 years, especially the past 30 years, without being profoundly conditioned by the experience. No one can be president of M.I.T. for eight years without effects even more profound. Those qualifications I have for my present responsibility come in part from my having lived in this environment of challenge and growth, from having experienced that quality of M.I.T. which tends to draw out the best in a man, to raise his sights, to require of him a performance beyond his and others' expectations. This effect M.I.T. exerts not only upon its students but upon its staff, especially upon its administrative staff, and most of all upon its presidents. This quality of challenging men to outdo themselves is one of M.I.T.'s most important trade secrets as an educational institution.

In this mood of looking backward, and on a festive occasion such as Alumni Day, another kind of observation about M.I.T. seems appropriate. The efficiency of all that we do at the Institute is greatly enhanced by our remarkable freedom from internal stresses, cliques, and factions. We are thus unusually free to concentrate the greater portion of our energies on important and constructive work. Over my 30 years of experience here, I recall astonishingly few episodes occasioned by self-serving, recalcitrance, or recrimination. This does not mean that we do not have differing opinions, or differences of opinion, vigorously held, but rather that we have an environment where such differences can occur without hardening into divisive, contentious issues. We do not lose stride or time because of bad track conditions. For this favorable condition many are responsible, including the great body of M.I.T. Alumni whose sympathetic support and interest are steadily directed toward the enhancement of the institution rather than to the exploitation of academic side shows.

Several years ago a stranger to M.I.T. asked my wife how she would describe the chief characteristics of the M.I.T. community. Her spontaneous, off-the-cuff response was "energy and friendliness." After reflection, energy and friendliness, hard work and good will still seem dead on the target.

. Mrs. Killian has asked me to express her deep gratitude for the help and encouragement she has received from every part of the M.I.T. community during the past months of convalescence. Both of us have been sustained and strengthened and given every assistance in a time of distress, and we can never forget



"On the other hand," President Killian tells Alumni, "we should not let these impressive totals create the misapprehension that we are a wealthy institution."

or adequately acknowledge all the acts of friendliness and thoughtfulness and spiritual lift from the people of M.I.T.

To these human characteristics of the institution which cannot be described in statistical terms, embodied in limestone, or reflected in a financial report, I would add a third. I speak of the Institute's capacity for decisive action, for quick response and direct action when conditions call for these responses. It was once said of Oxford University that nothing ever happens there for the first time. Fortunately, new things can and do happen here, and they sometimes happen very fast.

Why is this so? The condition which makes this possible is the pervasive confidence and sense of common cause which runs through its governing groups, the Corporation, the Faculty, and the Administration, and brings their actions into concert. We have separation of powers and delegation of authority resting upon this base of confidence rather than upon written statutes. The result is a responsive, flexible, decision-making process — one that can adjust itself to new

conditions and, if need be, act with boldness, speed and accord when occasions require.

These capacities for decision and fast action were impressively demonstrated when M.I.T. converted itself into a wartime establishment months before Pearl Harbor, and when M.I.T. was demobilizing and reconverting at the conclusion of the war. In many respects, this immediate post-war period was the most memorable, exciting, and forward-thrusting period in my administrative experience at the Institute. We were not working under the urgencies of war or with its priorities, but rather under the stimulus and vision of widened responsibilities and new destinies. The huge commitments of men and money and materials required by the war program were speedily and equitably liquidated. We undertook a large pumppriming fellowship program to re-establish our graduate school by bringing here able young scientists and engineers who had spent the war in war research and who had, therefore, matured beyond the normal age of graduate students. Without knowing always where the funds would come from, we made numerous and new appointments to the Faculty, particularly in such fields as nuclear physics, where it was clear that we should greatly augment our program. We embarked upon the nation's first college veterans' housing program, using the Institute's own funds to proceed with the construction of Westgate. We sought in every way we could to take advantage of the new concepts, the new technologies, the new directions which had grown out of war research. We moved to provide for a student body in size nearly double any that we had had before in order to take care of the veterans' demand. We brought about the appointment of the Faculty Committee on Educational Survey, whose subsequent report has been profoundly influential in our educational program and in our strategy as an institution. We began a determined search for new resources which culminated in the Development Program of 1948 and 1949. In all these ways and many others, we sought to recognize the fact that war had brought M.I.T. up onto a higher plateau of responsibility and opportunity.

I recall these memorable events and decisions because I think they profoundly affected the destinies of M.I.T., because they initiated a process of change and growth which is still in full tide, and because the way they came about illustrated so clearly the value of these imponderable qualities about which I have been talking - the concert and directness with which the Institute's governing bodies make the decisions and back the decisions which are important to the institution's advancement; our freedom to concentrate energies on constructive work undissipated by needless diversions; the basic concern here for the individual; a priceless invigorating quality of restlessness, self-dissatisfaction, innovation; a driving urge to greater excellence; a sense of the deep importance of our mission to the welfare of our country.

These are some of the imponderable qualities which make up the spirit, personality, and character of this Institute. We must be very sure as the Institute grows in size and complexity that we do not permit an attrition of these qualities. I can report to you that the Institute still possesses them unimpaired, but

I must also add that the governing bodies of the Institute have a very great responsibility that attrition does not take place as the size and complexity of the Institute increases.

Against this backdrop of the past, let me now report to you on recent, current, and impending devel-

opments at the Institute.

First on my list of the year's important accomplishments is the completion of the report of the Committee on Student Housing, the committee made up of representatives of the Faculty, Corporation, Administration, and Alumni Association, all under the chairmanship of Edwin Ryer, your former president and now a member of the Corporation. This committee, after a year's study, has come forward with a master plan for the development of student housing at the Institute. It has reaffirmed and sharpened the philosophical and educational concepts underlying our dormitory program. Particularly has it reaffirmed with eloquence the educational importance of student housing and the specific improvements we need to make this educational influence most effective. The committee boldly calls for extensive modifications in our present dormitories to make them better places in which to live and work and grow in intellectual maturity. It recommends that undergraduate housing be concentrated on the West Campus, that we start now to plan a new graduate center, using Walker Memorial and the dormitories adjacent to it, after suitable modifications, to give the Institute a wholly adequate and ample center for the living requirements of students of advanced standing at the Institute. It proposes that each of our dormitories be a complete housing unit with its own social areas and dining facilities. It endorses student recommendations for a student union on the West Campus. It proposes that we build additional dormitory accommodations for 400 undergraduates on the West Campus, and it proposes how these should be designed in terms of size and layout in order best to function as effective living educational units. It proposes altogether an extension and development of our housing system requiring an ultimate expenditure of about seven million dollars. In my judgment, this is the most thorough, the most far-seeing study that has ever been made for the planning and development of this part of the Institute's program. I commend it to all constituent bodies of the Institute, the Faculty, the Corporation, and the Alumni for their very deserving support.

This leads me to report on two important administrative changes at the Institute. In order that we may proceed without undue delay to carry through the recommendations of the Ryer Committee, we have asked Frank Bowditch, Dean of Students, to relinquish the duties of that office and devote his full attention as special adviser to the President to carry through to realization the proposals of the committee. In this new post, reporting directly to me, he will give concentrated attention to the planning, the fund raising, and the other requirements for realizing the concepts of the Ryer Committee. Dean Bowditch participated actively in the work of the Ryer Committee. It was his insistence on the importance of a long-term plan that led to the appointment of the committee.

He is admirably qualified to undertake this new re-

sponsibility.

To replace him as Dean of Students, we have appointed John T. Rule, Head of the Section of Graphics, and Head of Course IX. Jack Rule has worked closely and effectively with undergraduates, has commanded their confidence and affection, and has thought clearly and sympathetically about the whole range of personnel administration which centers in the office of the Dean of Students. We are fortunate in his willingness to accept this new assignment to serve as counselor and protagonist for the students and to coordinate the wide range of administrative activities which center in the office of the Dean of Students.

During the year, the Institute has embarked upon three large additions to its laboratory and equipment resources for education and research. One of these, a computing center made possible by the International Business Machines Corporation, will serve the needs not only of M.I.T., but of some 24 other colleges in New England. With its large fast digital research computer, the center will meet the rapidly growing needs of the Institute for this kind of service, particularly in research. It will also serve importantly the School of Industrial Management in its program to study, from the management point of view, the implications of data processing, automation, and computation, as used for management purposes.

The second major new facility planned during the year is a six billion volt electronic accelerator for physics research to be built, managed, and used jointly with Harvard University. This facility, which will be built with funds provided by the Atomic Energy Commission, will cost about six and one-half million dollars and will require about four years to

build.

The third project, the building of a nuclear reactor for research and educational purposes, is solely an M.I.T. project. Construction of the reactor started today now that all approvals have been received on the national and local levels for its construction. Costing about \$2,400,000, the reactor will be one of the most versatile ever constructed for research purposes and for teaching use, and it will give new impetus to the Institute's rapidly growing program of graduate study in the field of nuclear engineering.

Our Faculty continues to give searching attention to the constant reformulation which professional education requires. The School of Engineering, especially, keenly recognizes its opportunity to demonstrate that engineering education, if it is to meet the changing requirements of the engineer in our technological society, must search for new patterns of education to give the engineer a more fundamental and therefore more versatile and integrated grasp of his profession.

I need hardly report to you that our graduating students this June are finding no difficulty getting jobs. During the year, over 800 companies visited the campus to employ about 700 available students, and the mean salaries offered graduates ran \$427 for bachelor's degree men, \$490 for master's, and almost any figure for Ph.D.'s. The last two Junes our light varsity crew has gone to the Henley regatta and won. This summer the M.I.T. Choral Society is going to Germany for a series of concerts and, I am sure, will

conduct itself in its field with the same effectiveness as have our crews abroad. Last month we dedicated a great new organ in the auditorium, made possible by a gift of \$50,000 by Ex-Governor, Alvan T. Fuller. The organ in our chapel which has been used in recitals of great artistic values as well as for the religious purposes of the chapel, was given by Mr. Redfield Proctor, the ex-governor of Vermont. Thus we have two gubernatorial organs.

The Kresge Auditorium, as has been hoped, has become an important cultural center not only for M.I.T., but for the entire Boston area. Some 18 religious services take place each week in our chapel, and during this month of June, it will be the scene of some 14 weddings. The chapel has just been awarded the grand architectural prize of the Boston Arts Festival.

Last week we awarded 1,081 degrees, only a few under the peak number we awarded when the peak veterans' enrollment was graduated. Of the total degrees awarded last week, 432 were graduate degrees, the largest number of advanced degrees ever awarded at the Institute. It is worthy of note that in recent years the Institute has stood first in the country in the number of doctor's degrees awarded in engineering, metallurgy, meteorology, and physics and that it has stood third in the number of doctor's degrees in all fields of science and engineering, being exceeded only by Wisconsin and Cornell. In the immediate years ahead we plan to restrain further substantial growth in the student body.

As I reported at Commencement, gifts to the Institute for the current fiscal year will exceed \$9,000,000. With this level of gifts and with the fact before us that the book value of our plant, funds, and equipment now exceeds \$150,000,000, we must agree that M.I.T. is a fortunate institution in the financial support it has been receiving. On the other hand we should not let these impressive totals create the misapprehension that we are a wealthy institution in terms of the demands upon us or that we are achieving the degree of support that our national responsibility calls for. Occasionally I receive a letter or some-

(Continued on page 516)



48

Theodore T. Miller, '22 (left), who becomes president of the Alumni Association July 1, accepts gavel from Dwight C. Arnold, '27, retiring president.



Colonel Charles M. McAffee, Jr., Professor of Military Science, and Colonel Harmon Lampley, Jr., Professor of Air Science (above), and (below, left to right) Father Edward Nugent; Brigadier General Robert J. Fleming, Jr.; Captain William E. Howard; Major General Walter C. Sweeney; Vice president Edward L. Cochrane, '20, and Reverend Robert C. Holtzapple, who took part in R.O.T.C. commissioning exercises.



Commencement . . .

Por most persons taking part in Commencement and Alumni Day activities, these auspicious events mark the climax and finis to the school year and initiate vacation time. On the other hand, to those whose responsibilities require that the recollections and records of these ceremonies be spun into a thread of words to be indellibly recorded, the events are merely the beginning of a series of operations having a myriad of details; facts must be checked and re-checked, words for the written copy must be selected and their meanings weighed to create a proper tone, to recreate (as precisely as possible) the enthusiasm of participants, to portray, in proper perspective, the happenings which thousands witnessed.

This introduction is being written on Sunday, June 24. Photographs to appear in these pages have been selected, cropped, captioned, sized, checked, and sent to the engraver. Copy has been edited, estimated for length, checked, retyped, and checking typescripts have been sent to authors. The size of the July issue has been set, advertising plates are in the hands of the printer, and layouts for editorial pages have gone through several revisions. The last manuscripts for the Alumni Day symposium have just been received. Although two weeks late and longer than anticipated, somehow they must be fitted into this issue. To do so requires that another article be dropped, that editorial pages be remade again, that earlier drafts of this report be revised, rewritten and condensed.

This is the twelfth Alumni Day, and the thirteenth Commencement exercise, to be recorded in these pages by The Review's ninth editor since April 1945. Wherein do events of this year differ significantly

from those previously chronicled?

throat competition.

Well – first of all, this year's graduating class is the largest to leave M.I.T. in its 90 year history, if we except the Class of 1948 which was composed, primarily, of World War II veterans attending class with the aid of Uncle Sam. More advanced degrees were awarded this year than ever before. Each of this year's graduates had the choice of several job offers, with record starting salaries; few of them have lived through a depression or know the meaning of cut-

As for Alumni Day, it too, had its innovations. This year all events were "on the campus." In the Kresge Auditorium five internationally known scientists presented papers at an outstanding symposium on "Science and the Health of Mankind." At the luncheon President Killian reviewed M.I.T. progress before 1300 persons who also saw Vannevar Bush, '16, honored by the Alumni Association. For the first time the Alumni Day banquet was held in Rockwell Cage, and wives and friends composed a significant fraction of the 1200 who attended this new kind of banquet. Instead of the steins or Wedgewood plates of earlier years, each banqueter received a number of general merchandise souvenirs. Many other prizes - some valued at more than 50 dollars, - were awarded by ticket drawing.

. . . . and Reunion

Events of Senior Week

The first five days of June were given over to the events of Senior Week, in which members of the Class of 1956 had ample opportunity to attend the traditional banquets, parties, cruises, concerts, and dances

prior to their graduation.

On Thursday, June 7, Commissioning Exercises for the Reserve Officers Training Corps were held at 10:30 a.m. in Kresge Auditorium. In these exercises 89 cadets received commissions in the Army Reserve, 39 more will receive Army commissions upon completion of summer camp, 32 received commissions in the Air Force Reserve and an additional 17 will receive Air Force commissions after training in camp this summer.

Commissioning Exercises

Although M.I.T. does not have a Navy R.O.T.C., it was pleasant to have the three major branches of the United States Armed Forces represented at these exercises at which Edward L. Cochrane, '20, Vice-president of the Institute presided. Speakers at these exercises were:

For the Air Force: Major General Walter C. Sweeney, Commander, Eighth Air Force, Strategic Air Command, Westover Air Force Base, Mass.

For the Army: Brigadier General Robert J. Fleming, Jr., Division Engineer, New England Division, Corps of Engineers, Boston.

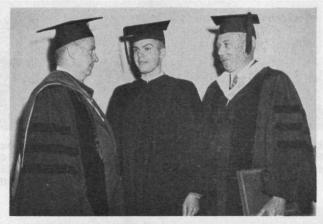
For the Navy: Captain William E. Howard, Com-

manding Officer, Boston Naval Shipyard.

Oath of Office was administered to the cadets by Colonel Charles M. McAfee, Jr., Professor of Military Science and Tactics representing the Army. Colonel Harmon Lampley, Jr., Professor of Air Science at M.I.T., represented the Air Force in these ceremonies.

Baccalaureate Service

On the afternoon of June 7, the Baccalaureate Service was held in Kresge Auditorium for members of the graduating class and their friends. President Killian gave the invocation and prayer, George William Luhrmann, Jr., President of the Class of 1956, gave the scripture reading, and John Ely Burchard, Dean of the School of Humanities and Social Sciences made the address entitled "To Begin to Live." Dean Burchard's long and stimulating address emphasized



President James R. Killian, Jr., '26; George William Luhrmann, Jr., President of the Class of 1956; and Dean John E. Burchard, '23 (in usual order), took part in baccalaureate services.



In recognition of his long service as Registrar at the Institute, Joseph C. MacKinnon, '13, receives from President Killian a certificate of appreciation at Commencement exercises.

the need for continual education for admission into the "company of educated men."

At the luncheon in Du Pont Court following Commencement Exercises, head table guests included (left to right): Godfrey L. Cabot, '81; Dwight C. Arnold, '27, President of the Alumni Association; Mrs. Harold V. Coes; Joseph C. MacKinnon, '13, Registrar since 1923; Mrs. J. C. MacKinnon; Dr. James Cresse, President of Drexel Institute of Technology; Mrs. Neil H. McElroy; President James R. Killian, Jr., '26; Neil H. McElroy, President of the Procter and Gamble Company and principal speaker at Commencement exercises; Mrs. James R. Killian, Jr.; Rabbi Roland B. Gittelsohn, who gave the invocation at Commencement exercises; Harold V. Coes, President of the Class of 1906; Mrs. Richard D. Fay; Richard D. Fay, '17, retiring Professor of Electrical Engineering; Mrs. Dwight C. Arnold; George William Luhrmann, Jr., President of the Class of 1956; and John Selim Saloma, 3d, '56, President of the Institute Committee.







Distinguished guests at the head table on Alumni Day included (left to right): Thomas W. Mix, G.; Donald W. Kitchin, '19; Mrs. Donald W. Kitchin; Godfrey L. Cabot, '81; Harold V. Coes, '06; Mrs. Harold V. Coes; Augustus B. Kinzel, '21; Mrs. H. E. Lobdell, '17; Mrs. Dwight C. Arnold; Edward J. Hanley, '24; Mrs. Vannevar Bush; President Killian, Jr.; and Gilbert M. Roddy, '31, at microphone.

Commencement

Degrees were awarded to 1,028 men and 13 women in the Institute's 90th commencement exercises held in Rockwell Cage on Friday, June 8. Degrees awarded this year by the Institute included 649 bachelor's degrees, 305 master's, 45 engineers, and 82 doctorates, or 1,081 degrees in all.

Officers of the Class of 1956 who took part in the commencement exercises were: George William Luhrmann, Jr., President; Adolph Jacoby Hansen, Vice-president; Bruce Bradford Bredehoft, Secretary-Treasurer; and Irwin Christopher Gross, Senior Marshal.

Invocation at commencement execises was given by Rabbi Roland B. Gittelsohn of Temple Israel, Boston, and President Killian gave the Charge to the graduates. Neil Hosler McElroy, President of Proctor and Gamble Company and Chairman of the Committee for the White House Conference on Education gave the principal address. The Review is pleased to present Mr. McElroy's address "Leadership Through Education in America" on page 471 of this issue.

Although not publicly announced, a pleasant and unusual event at the commencement exercises was the presentation of a diploma to Joseph C. MacKinnon, '13, Registrar, who retires on July 1. As shown on page 489, President Killian delivered the certificate of appreciation to Mr. MacKinnon in recognition of his 33 years of faithful and effective service as Registrar, during which time he has personally had responsibility of handing out diplomas to 32,000 Technology graduates.

Following the Commencement exercises, Technology graduates, with their families and friends, had opportunity of attending informal luncheon in Du Pont Court. Brief addresses were made by President Killian; Harold V. Coes, President of the Class of

1906; James Creese, President of Drexel Institute of Technology (whose son was a member of the Class of 1956 at M.I.T.); George W. Luhrmann, Jr., President of the Class of 1956; and John S. Saloma, 3d, '56, President of the Institute Committee. Guests were then received by President and Mrs. Killian, Vice President and Mrs. Stratton, Dean and Mrs. Bowditch, and Messrs Luhrmann and Saloma.

Symposium on Health

Alumni Day, June 11, offered opportunities to learn of contributions that technology is making to the health of mankind. Under the chairmanship of Dr. Egon E. Kattwinkel, '23, an unusually significant symposium was presented in Kresge Auditorium on "Science and the Health of Mankind." Unfortunately. Dr. Kattwinkel had suffered a broken ankle and was unable to act as moderator; his place was taken by Dr. James Faulkner, M.I.T. Medical Director. Those presenting papers as part of the symposium were: Henry van Zile Hyde, Chief of the Division of International Health, U. S. Public Health Service: Gordon M. Fair, '16, Gordon McKay Professor of Sanitary Engineering, Harvard University; John G. Trump, '33, Professor of Electrical Engineering, M.I.T.; Francis O. Schmitt, Professor of Biology, M.I.T.; J. George Harrar, Director for Agriculture, The Rockefeller Foundation. The Review is pleased to present these symposium papers which begin on pages 474 to 483, inclusive.

Alumni Day Luncheon

Some 1,300 Alumni and members of their families gathered under canvas to take part in an informal buffet luncheon at which Gilbert M. Roddy, '31, luncheon chairman, was master of ceremonies.

On behalf of the Alumni Association, Dwight C. Arnold, '27, presented a certificate of appreciation to Vannevar Bush, '16, in recognition of his leadership, to M.I.T. and to the nation, in science, education, and administration. In response Dr. Bush commented on the changes that had taken place from 1938, when he became President of the Carnegie Institution of

Following luncheon on Commencement Day, graduates and their families were received by President and Mrs. Killian (hardly shown in this view), Vice president and Mrs. J. A. Stratton, '23; Dean and Mrs. E. Francis Bowditch; George William Luhrmann, Jr., President of the Class of 1956; and John Selim Saloma, 3d, '56, President of the Institute Committee.



On Alumni Day, guests at the head table included (left to right): G. M. Roddy, '31; Vannevar Bush, '16; Mrs. James R. Killian, Jr.; Dwight C. Arnold, '27 (beyond the tent pole); J. George Harrar; James M. Faulkner; Gordon M. Fair, '16; Mrs. G. M. Fair; Francis O. Schmitt; Mrs. F. O. Schmitt; John P. Larkin, '26; Mrs. John P. Larkin; Arthur K. Hunt, '85; and William K. Campbell, '86.

Washington until his retirement in 1956 when he returned to M.I.T. as adviser to President Killian.

President Killian then presented his eighth "State of M.I.T." address. Alumni who missed this opportunity to hear President Killian report on progress at the Institute during the past year will find Dr. Killian's address recorded on page 485 of this issue.

Afternoon and Evening Events

In the afternoon the Homberg Infirmary and many laboratories associated with biology or man's health, were open for inspection. Motion pictures of "The SAGE System" were alternated with organ recitals at Kresge Auditorium. At 5:45 P.M., in sunny weather, Alumni gathered on the green adjacent to the auditorium for a social hour.

At 7:30 the doors of Rockwell Cage were opened for a new kind of banquet to replace the "Stein-on-the-table" prandial events of past years. About 1,200 Alumni and their wives were seated by classes, and served a catered filet mignon dinner. The evening was then given to a few matters of business and awarding of special prizes.

In reporting on his presidential term of office, D. C. Arnold, '27, stated that special effort had been made to keep Alumni intelligently informed of M.I.T. activities through the Alumni Officers' Conference, the Midwinter Alumni Meeting and two Regional Conferences, all of which have been reported in the current volume of The Review.

Hedlund Honored

Mr. Arnold then asked Ralph T. Jope, '28, to conduct Oscar F. Hedlund to the platform for induction to Honorary Membership in the Alumni Association. Mr. Hedlund has been track coach at M.I.T. since 1921 and is known to thousands of Technology athletes; in fact he has become a traditional figure at M.I.T. Mr. Hedlund's own record as an athlete was reported; he was once an Olympic runner-up. In 1953 upon his retirement, President Killian, '26, commented that "Oscar has shown that athletics can be fun."

Gift Presentation

Howard L. Richardson, President of the Class of 1931, made the presentation of the Class gift to President Killian. In making this presentation, Mr. Richardson recalled the difficult times the members of the Class had in finding jobs upon graduation and stated



Time out to reminisce about the M.I.T. of an earlier era is taken by this trio who, temporarily at least, forego the libation of the social hour for a quiet chat on the steps surrounding the Kresge Auditorium.

Receiving guests on Alumni Day (left to right): President Killian, Jr.; Dwight C. Arnold, '27; Vice president J. A. Stratton, '23; Theodore T. Miller, '22, President-Elect of Alumni Association; and Vannevar Bush, '16, who returned to M.I.T. after retirement and was honored at the Alumni Day Luncheon.





that 276 members had returned for their 25th reunion and appear now to be doing well in business and industry. In fond memory and appreciation of the leadership which Karl Taylor Compton gave the Class of 1931, they established a scholarship fund for outstanding students so that one freshman might come to M.I.T. without regard to the cost. The Class contributed \$30,000 for this fund, the income of which is to be made available for Freshman scholarship each year.

Following Mr. Richardson, E. Sherman Chase, Vice-president of the Class of 1906, made his gift of \$40,000 to President Killian who accepted both gra-

ciously on behalf of M.I.T.

Transfer of Gavel

Dwight C. Arnold, '27, then introduced Theodore T. Miller, '22, after stating how much he had enjoyed his year of service as president of the Alumni Association. His enjoyment was occasioned by the fact that he had had ample help for the conduct of his office from the Alumni Association, and ample help from committee members who served gladly, and finally because the Alumni Association constitutes, stated Mr. Arnold, "the finest group of people one can find anywhere in the world." With these words he presented the gavel to Mr. Miller who succeeds him July 1.

Mr. Miller spoke briefly on the achievements of the Alumni Fund in the past two years. Last year, when the Compton Memorial Fund was under way, Alumni

Joseph E. Conrad (left) and Donald W. Kitchin, '19 (at microphone), distribute prizes to lucky winners at Alumni Day banquet.



As Alumni gathered for the social hour on Alumni Day, this scene might have reminded them of "At the Sign of the Three Brass Balls." Actually, the domes are those of Building 10, built in 1916; Building 7, built in 1938; and the Kresge Auditorium, dedicated in May, 1955.

contributed \$546,000 excluding an equal amount contributed by Alfred P. Sloan, Jr., '95. Mr. Miller reported Alumni contributions of \$536,000 for 1956. But, proving Mr. Miller's contention that "last year's surge has become this year's urge", Review readers will be pleased to learn that the Fund closed on July 1 with a new high of \$558,000.

The Institute's aim of emphasizing quality rather than quantity in its student body was heartily endorsed by Mr. Miller who announced that the Alumni Fund Board had voted \$50,000 for Alumni Scholarships this year; this will finance 45 man-years of

tuition for worthy students.

Festivities of the Evening

David W. Skinner, '23, then became master of ceremonies for the rest of the evening and conducted the program of entertainment and the awarding of gifts and prizes. All those present received a generous supply of gifts such as writing paper, cards, bandaids, plastic bags, aluminum foil or tape measures, orchids for the ladies, and the like. In addition, special prizes in this "new kind of Alumni day" were awarded by prize drawings from numbered banquet tickets.

Finis

As Technology graduates left the banquet with their general or special prizes, another Alumni Day came to a close. On the part of many, the events of the year-end required much thought, effort, time, and energy. Those providing the inspiration and leadership for the occasions have already been acknowledged; they have had their places of honor at head tables, their names have appeared in programs, and in some cases their pictures appear on these pages. As we salute this able group of leaders, it is also appropriate to recall that wars are not won by generals alone. At least once a year we can take time out to recognize the able staff work that is supplied by many who never have the opportunity to "take a bow." This the editor does with pleasure.

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE







Recently moved into high administrative posts at the Institute are (left to right) John T. Rule, '21, who becomes Dean of Students; E. Francis Bowditch, who becomes Special Adviser to the President; and J. A. Stratton, '23, who was named Chancellor by President Killian.

Chancellor Stratton

A PPOINTMENT by the M.I.T. Corporation of Julius A. Stratton, '23, to the newly established post of Chancellor of the Institute was announced at a special meeting of the Faculty on June 13 by James R. Killian, Jr., '26, President. Dr. Stratton was appointed provost in 1949 and vice-president in 1951.

In making this announcement, which Faculty members heartily endorsed, President Killian said:

As Chancellor, Dr. Stratton will administer the Institute's academic program in all its parts, with all aca-

demic officers coming under his jurisdiction.

In addition, he will act as deputy to the President, who is the Institute's chief executive officer. The Chancellor will serve as the general executive officer for all Institute affairs, and in the absence of the President, shall have all the powers and perform all the duties and functions of the President. He is a member of the Corporation and now becomes a member of its Executive Committee.

The creation of the post of Chancellor for Dr. Stratton recognizes his immense contributions to M.I.T. and his leadership in science and education both at M.I.T. and nationally. It recognizes the increased scope and responsibilities of M.I.T., its many and unusual national obligations at this time, and the consequent need for a greater sharing and delegation of its administrative responsibilities.

I speak with delight and enthusiasm for the still closer partnership of Dr. Stratton and myself made possible by his new status. We have long worked together with a sense of common purpose and extraordinary concert on policy. With Dr. Stratton taking the major responsibility for the internal affairs of the Institute, our joint administrative efforts will be more effectively allocated and organized.

With Dr. Stratton as my deputy and directly responsible for our academic administration, with Admiral Edward L. Cochrane, '20, as Vice-president to handle our extensive relations with Industry and Government, with Joseph J. Snyder, 2–44, as Vice-president and Treasurer, and with the administrative changes which Dr. Stratton's new post will ultimately make possible, I am confident that we shall be prepared to meet any and all administrative demands that the remarkable growth and development of the Institute may impose upon us.

Biographical data on Dr. Stratton appeared in the February, 1956, issue of The Review with the announcement of Henry Ford, 2d, that Dr. Stratton had been elected trustee of the Ford Foundation.

In High Posts

A PPOINTMENT of E. Francis Bowditch, Dean of Students, to a new office at the Institute and of John T. Rule, '21, Professor of Engineering Graphics, to succeed him as Dean was announced in June by James R. Killian, Jr., '26, President.

Mr. Bowditch will become special adviser to the President in development of a new \$7,000,000 dormitory program, outlined on page 486. This program is to be undertaken as the result of an extensive study by the Committee on Student Housing, headed by Edwin D. Ryer, '20, an alumnus of the Institute and member of the Corporation. A member of this committee, Dean Bowditch was also chairman of the Faculty Committee on Student Environment and chairman of the Faculty Committee on Discipline.

JULY, 1956 493

"Dean Bowditch participated actively in the work of the Ryer Committee," President Killian said. "It was his insistence on the importance of a long-term plan that led to the appointment of the committee. He is admirably qualified to undertake this new responsibility."

Mr. Bowditch was appointed Dean of Students in 1951, as recorded in the April, 1951, issue of The Review, which contains biographical data on him.

Professor Rule comes to the deanship from a position as Head of the Section of Graphics and Head of the M.I.T. course in General Science, General Engineering, and Science Teaching. He has been on the M.I.T. Faculty since 1936. He was chairman of the M.I.T. Student-Faculty Committee for two years, a member of the Undergraduate Policy Committee for four, and has been educational consultant for the Committee on the College Student in the Group for the Advancement of Psychiatry for the past five years. He has been faculty marshal at commencement.

A native of St. Louis, Professor Rule was graduated from M.I.T. in 1921 and then attended Harvard University. He was a consulting engineer in St. Louis for several years and entered teaching as head of the science and mathematics department at the Taylor School in St. Louis.

Professor Rule is widely known for his research and development in various phases of three-dimensional vision, including stereoscopic drawings, photography, and motion pictures. During World War II he devoted most of his time to war research with the Polaroid Corporation and was in charge of the development of the Mark I machine gun trainer for the United States Navy. He was also associated with research projects, in the Bureau of Ordnance.

Hewes Becomes Registrar

THE appointment of Robert E. Hewes, '43, as Registrar at the Institute was recently announced by Julius A. Stratton, '23, Vice-president and Provost of the Institute. Mr. Hewes, Associate Registrar since 1953, will succeed Joseph C. MacKinnon, '13, who retired July 1 after serving as Registrar since 1923.

Mr. Hewes is 35 years old and was born in Beacon, N.Y. He is the son of Mr. and Mrs. Earl D. Hewes and his father was superintendent of schools in Beacon for 35 years until his retirement in 1954. Mr. Hewes was educated at the Beacon High School and was graduated from Bowdoin College with the degree of bachelor of science in 1942. A year later he received the degree of bachelor of science from M.I.T. Upon his graduation he joined the staff of Convair in San Diego as a flight-test engineer. He returned to M.I.T. in 1948 as Assistant Registrar.

He is a former president of the New England Association of Collegiate Registrars and Admissions Officers and was recently elected to the Executive Committee of the American Association of Collegiate Registrars and Admissions Officers.

The retiring Registrar, Mr. MacKinnon, a native of Seattle, Wash., has long been one of the Institute's most active officers. He was graduated from M.I.T. in 1913 and served as assistant and instructor in Physics from 1915 to 1922 when he joined the staff of the Registrar's Office.

L.I.S. Gommencement

THE 52d graduation exercises of the Lowell Institute School, which operates under the auspices of M.I.T., were held in Huntington Hall at the Institute on Wednesday evening, May 23. Approximately 150 students received certificates or diplomas.

Major General James McCormack, '37, special adviser to the President of M.I.T., represented James R.

Killian, Jr., '26, President, at the exercises.

The commencement address was given by Helge Holst, '31, Treasurer and Business Manager of Arthur D. Little, Inc. A feature of the exercises was the 11th presentation of the Charles Francis Park Medal for outstanding work.

According to long-established custom, Ralph Lowell, trustee of the Lowell Institute School, awarded the certificates, and Arthur L. Townsend, '13, Associate Professor of Mechanical Engineering, and Director of the School for many years, presided — introducing the speakers and presenting the students for their diplomas.

Nathaniel McL. Sage: 1890-1956

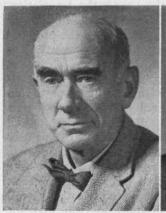
N ATHANIEL McL. SACE, '13, Director of the Office of Sponsored Research and Placement Officer at the Institute and a member of M.I.T.'s administrative staff since 1937, died on May 14 at his home in Brookline.

As director of M.I.T.'s Division of Industrial Cooperation from 1940 to 1954, Mr. Sage was responsible for the pioneering relationships between the Institute and the many government agencies which sponsored defense research at M.I.T. The patterns set during this period became the standard by which educational institutions undertook defense research contracts from both government and industry, and they remain the principal basis for today's co-operation between educational laboratories and outside groups. For this work Mr. Sage was awarded in 1948 the President's Certificate of Merit, the nation's second highest civilian award, for "outstanding services to his country."

Mr. Sage, who had wide experience in industrial administration, came to the Institute in 1937 as Placement Officer. He was born in Fort Davis, Texas, in 1890, and studied civil engineering at M.I.T. with the Class of 1913.

His wide industrial experience included executive positions with the Aberthaw Construction Company of Boston and the Package Paper Company of Holyoke, Mass. During World War I, as superintendent of production control and later superintendent of power construction at the Squantum destroyer plant, he pioneered in applying volume production methods to the building of destroyers.

In 1955 Mr. Sage became director of the Office of Sponsored Research at M.I.T., a new office created to provide a unified administrative organization for the Institute's increasing commitments in industrial and defense research. Throughout his career at M.I.T., Mr. Sage continued his active role as Placement Officer, and he was widely recognized throughout the nation for his leadership in this phase of industry-education co-operation.









Among recent changes in the Institute's Faculty and Administrative personnel are (left to right): Richard D. Fay, '17 Associate Professor of Electrical Communications; Joseph C. MacKinnon, '13, Registrar; and Delbert L. Rhind, Assistant Treasurer — all of whom assume emeritus status on July 1. At the extreme right is Robert E. Hewes, '43, who succeeds Mr. MacKinnon as Registrar of the Institute.

A Century of Service

Three members of the Institute's Faculty and Administration, whose combined service to M.I.T. totals 104 years, retired on July 1. They are Joseph C. MacKinnon, '13, Registrar; Richard D. Fay, '17, Associate Professor of Electrical Communications; and Delbert L. Rhind. Assistant Treasurer.

Professor Fay received the A.B. degree from Harvard University in 1915, and two years later received the S.B. degree from Harvard and M.I.T. During World War I he was associated with the Submarine Signal Company, in charge of the experimental station at Nahant, Mass., operated to develop devices for detecting and locating submarines by subaqueous sound. From 1919 to 1925, Professor Fay was engaged in commercial research problems on sound, and from 1925 to 1928 was engaged in the development of loudspeakers as a consulting engineer. In 1928 he was appointed research associate at M.I.T. He became assistant professor in 1930, and associate professor of electrical communications in 1934. He is well known for his contributions in the field of electro-acoustics.

Mr. MacKinnon received the S.B. degree in Electrical Engineering from the Institute in 1913. He joined the staff as assistant in physics in 1915, became instructor in physics in 1918, and was lecturer on statistics in the Department of Economics from 1932 to 1935. In addition to these teaching posts, he has had important administrative responsibilities. He was made assistant to the acting registrar in 1922, and registrar in 1923. As registrar, his jurisdiction included administration of the Records, Information, and Schedules Offices of M.I.T. From 1934 to 1951 he was, first, acting and then assistant secretary of the Faculty. He was treasurer of the Association of Collegiate Registrars for a number of years, and president of that organization in 1940.

Mr. Rhind served in the U.S. Navy during World War I and was discharged with the rank of ensign. Except for this military service, he was associated with the Bay State Trust Company (now Old Colony Trust Company) from 1909 until his appointment as assistant bursar at the Institute in 1921. His entire

career, thereafter, was devoted to the Institute's fiscal problems. He was made bursar in 1934, and assistant treasurer in 1954. In June, 1952, Mr. Rhind was made an honorary member of the Alumni Association.

Review Consultant

JOHN J. ROWLANDS, head of the Technology News Service since 1925 has been appointed Consultant for The Technology Review. He was contributing editor to The Review from 1923 to 1933, and since 1933 has been one of its valued editorial associates. Mr. Rowlands thus continues association with this publication, which began more than three decades back, while on leave of absence from the Institute.

Humanities Chairs Established

A GRANT of \$560,000 from the Ford Foundation, to establish two chairs in the School of Humanities and Social Studies and to advance research in international communication in the Center for International Studies at M.I.T., has been announced by John E. Burchard, '23, Dean of the School of Humanities and Social Studies.

The grant makes it possible for the School of Humanities and Social Studies and the Center for International Studies to take the first steps in a broad plan for underwriting several such chairs. It also assures continuation of studies in international communication started four years ago under an earlier grant from the Ford Foundation.

The new grant of \$560,000 will permit the continuation of research in the field of international communication being conducted in the Center for International Studies and will permit the inauguration of graduate teaching in that field by the Political Science Section of the Department of Economics and Social Science.

While the two chairs will be devoted to this specific purpose as long as the present need lasts, the long-run purpose of the grant, which is made on a 25-year basis, is to strengthen teaching and research in the social and political sciences at M.I.T.

495

Affairs of Council

A substantial amount of business was transacted at the last meeting of the Alumni Council for the current season. With Dwight C. Arnold, '27, President of the Alumni Association, presiding, 123 members and guests attended the 318th Council meeting, which was held at the Faculty Club on the evening of Monday, May 28, 1956.

As Secretary of the Association, Donald P. Severance, '38, reported that: (1) seven changes in class affiliation had been approved; (2) an even dozen different members of the M.I.T. staff had visited 13 alumni clubs between April 25 and May 24; (3) a budget of \$75,449 for operation of the Alumni Association Office had been approved by the Executive Committee; (4) paid officers of the Association, who have served for the 1955-1956 season, have all been re-elected for the 1956-57 season; (5) a newly created position of Regional Director of the Alumni Fund will be filled by Joseph E. Conrad; (6) 22 persons had been nominated to serve on 10 committees of the Association for periods from one, to as long as six, years. The Council voted acceptance of the Secretary's report, together with appointments of all nominations for the stated terms of office.

As Executive Vice-president, H. E. Lobdell, '17, read his annual report dealing with progress in the Association for the 1955-1956 season. A substantial portion of Mr. Lobdell's report dealt with statistics relating to the distribution of Alumni, both by age as well as by geographical location. The material on alumni population, as given on pages 468 and 469 of this issue, is essentially the same as those portions of Mr. Lobdell's report dealing with geographical distribution.

As chairman of the Alumni Fund Board, Theodore T. Miller, '22, reported that, as of May 28, contributions to the Alumni Fund from 9,915 Alumni amounted to \$475,300.

Samuel C. Prescott, '94, chairman of the Committee on Honorary Members, reported that his committee had unanimously nominated Oscar F. Hedlund

for honorary membership this year in the Association. Mr. Hedlund is known to thousands of Alumni for his work, since 1921, as coach of track, and the proposal of his name for this distinction won enthusiastic applause from the Council.

Professor John B. Wilbur, '26, Head of the Department of Civil and Sanitary Engineering, reported on the progress and educational philosophy of a new subject "Civil Engineering Projects" taken by all second-year students in his Department. In this new subject, given for the first time in the fall 1955 term, sophomore students were required to work on the planning of three major civil engineering projects: a vehicular tunnel across Manhattan Island; a development of a river valley in Haiti; and the plan for light manufacturing concerns to be built in the Boston area near Route 128. Each of these major projects is divided into smaller problems, and a new problem is assigned at the end of each one-hour discussion period. A minimum of data and explanation is given to the students, so that they are encouraged to use their judgment and imagination in arriving at solutions to their assigned problems. Some element in every problem requires information or techniques not known to Sophomores. Criticism of the solutions and progress in these discussion periods is primarily by fellow students.

It is Dr. Wilbur's belief that this approach goes further in providing perspective and orientation for the work to come than do the usual types of subjects; that it provides a motivation to study subsequent technical subjects in civil engineering; and that it is important to the development of judgment.

As final speaker for the evening Professor Walter Wrigley, '34, Deputy Director of the Instrumentation Laboratory, described the principles of the latest aircraft navigation system by which the course of an airplane can be ascertained without the aid of instruments providing visual, radio, or radar contact external to the airplane. He mentioned particularly the principle of the earth radius pendulum and described the new types of gyroscopes that have been developed and the sources and magnitudes of errors in some of this equipment.

On June 12, Professor Bernard E. Proctor, '23, Head of the Department of Food Technology at M.I.T. (left), was honored in St. Louis when he received the Nicholas Appert Award from Clarence K. Wiesman, chairman of the Chicago section of the Institute of Technologists. The award was presented to "Bernard Emerson Proctor, Inventive Researcher and Students' Friend." The Nicholas Appert Medal Award, established in 1941 by the Chicago section, I. F. T., is awarded annually by a jury of the Institute members to one who "because of his pre-eminence in and contribution to the field of Food Technology, is deemed worthy of special recognition."

Eugene Taylor

BUSINESS IN MOTION

To our Colleagues in American Business ...

This is called a rack. It is fastened to electric light poles to hold wires from pole to pole, and from pole to house. Perhaps you may have noticed racks on poles, but unless your electric company has recently replaced them on the lines in your vicinity you have not seen anything quite like this. It is made of aluminum, instead of galvanized steel, and is assembled almost entirely of extruded shapes.

Naturally you will think that aluminum was chosen

in order to save weight, and as a matter of fact, lightness plus strength is a factor. The aluminum rack is five to six pounds lighter, and that is appreciated by the linemen who have to put the rack on the pole after they have climbed it. However, lightness is not the main consideration. Long life is the big advantage. Modern methods of treating poles with preservatives

make it reasonable to assume that a pole will last for 50 to 60 years. Now for the first time there is a rack or bracket, as it is sometimes called, that should outlast the pole. As soon as aluminum is exposed to the air, a thin film of oxide forms, and this is a protection against further action by air and rain. As for price, the aluminum rack costs a little more, but this is compensated, many times over, by the increased years of service.

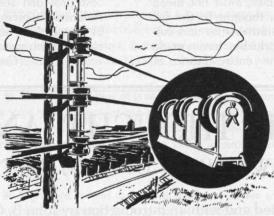
There are some interesting features of design that are worth noting. The extruded shape that forms the

base of the rack is adequately ribbed for strength, and in addition, provides a channel into which the arms are slid after having been notched and bent at right angles. The channel and the arms together take the pull of the wires; the rivets are used just for positioning. Incidentally, the rack has to withstand a total pull of 6,000 pounds. The arms are formed with a slight longitudinal camber or bow and have rounded edges, because linemen pull the wires across them,

and the camber and edges protect the insulation from damage. The rod on which the insulators are threaded is extruded aluminum. One final detail, which is not easy to see in the drawing; the bottoms of the base are toothed, to hold to the pole better.

Revere takes especial satisfaction in this new and superior rack, because the Technical Ad-

visory Service, the Mill, and the customer worked so closely together. There was a joint attack on the problem of developing a product that would not only be better, but could be assembled simply and economically. Suppliers to industry are not only well informed regarding their materials, but glad to cooperate with customers and prospects on matters concerning specification and fabrication. Revere suggests that you call upon your suppliers not only to fill orders, but to place their skill and knowledge at the disposal of your designers and production people.



REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

Executive Offices: 230 Park Avenue, New York 17, N.Y.

JULY, 1956 497

LEADERSHIP THROUGH EDUCATION

(Continued from page 473)

important step, taking into account as it does the fact that we can reach our tremendous educational objectives only if we anticipate our problems and seek their solutions in time.

In one way or another, we are going to provide facilities adequate for our university and college population. This country will not let its institutions of learning reach the point where the fundamental American right of opportunity for all is denied. As our university and college enrollment doubles over the next 15 years, our tax-supported institutions inevitably will absorb the bulk of the increased numbers. This trend already is under way. Whereas in recent years the per cent of students in tax-supported schools has been about equal to those in independent institutions, the ratio today has shifted toward 60:40 in favor of the publicly supported institutions. These centers of education perform a broad and highly essential role. They make a gigantic contribution to the nation's educational progress, and they have earned the warm support and appreciation of the American people in making it, including a willing provision of the needed tax dollars.

But this does not mean—in fact, must not mean—that we should give any less thought to the essential role of our independent universities and colleges. These institutions historically have made invaluable contributions to the entire fabric of

higher education in America. With their freedom to experiment with curricula and methods, to set standards as high as they think best, their independent traditions, they serve as pace-setters for the whole of our educational system. They produce a major share of our leadership in education, and, on the record, turn out more than their share of all kinds of leaders of our nation.

But today, when they should be building and expanding to meet tomorrow's needs, our privately endowed colleges and universities are having to fight simply to hold their own. When we look at the approximately 1,000 independent colleges and universities in the United States, we find that on the average, in terms of purchasing power, they have 20 per cent less to spend for each student than they had in 1940. For at least some period during the past six years, half of our private colleges have been operating at a deficit, according to a study by the Council for Financial Aid to Education.

Clearly, there is need for a new look at this problem. Financial support on a scale larger than we have yet envisioned must be mobilized behind these institutions. Endowment earnings have not and probably cannot be expected to keep pace with the rapidly growing needs.

Tuitions may be able to carry a larger share of the cost provided some of the better programs of installment financing of higher education are found to fit the needs of an America more and more of whose citizens each year find themselves better able to buy

(Continued on page 500)

LANGUAGE, THOUGHT, AND REALITY

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Edited and with an introduction by John B. Carroll Foreword by Stuart Chase

xi + 278 pages

Illustrated

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Once in a blue moon a man comes along who grasps the relationship between events which have hitherto seemed quite separate, and gives mankind a new dimension of knowledge. Einstein, demonstrating the relativity of space and time, was such a man. In another field and on a less cosmic level, Benjamin Lee Whorf was one, to rank some day perhaps with such great social scientists as Franz Boas and William James.

He grasped the relationship between human language and human thinking, how language indeed can shape our innermost thoughts: — Stuart Chase

Whorf's memorable Technology Review essays as well as important hitherto unpublished papers are included in this significant volume published jointly by John Wiley and Sons, Inc. and

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ICBM and IRBM are prime examples The Intercontinental Ballistic Missile and the Intermediate Range Ballistic Missile, Air Force programs for which we have over-all systems engineering and technical direction responsibility, are prime examples of programs that require the systems engineering approach. Most Ramo-Wooldridge work is of such a systems character, requiring the concurrent solution of a wide variety of interrelated technical and operational problems. Additional examples at R-W are communications, fire-control, and computer programs for the military, and automation and operations research projects for business and industry.

Pertinent technical fields Successful execution of systems engineering programs requires that the technical staff include experts in a considerable number of scientific and engineering specialties.

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LEADERSHIP THROUGH EDUCATION

(Continued from page 498)

the things they consider important. However, it is not expected that tuition income can bridge the gap.

More money should come to the independent colleges and universities from their alumni. These men and women should know that they did not pay the full cost of their education when they were in college and hence should help provide the funds for students of later generations. Alumni should learn to budget money to be given to colleges and universities in the same way they budget other contributions of a substantial nature.

And, of course, corporate giving to education must also come to be looked upon as the kind of business philanthropy which is accepted as good business. There can be no doubt in the mind of any thoughtful businessman that a decline in the quality of higher education would be reflected in a reduced quality of management and other key personnel performance. It should take no extended rationalization for business and industry to realize that the maintenance of the vitality of the independent college and university is of provable importance to the future profitability of business enterprise. The size of corporate contributions as measured by standards of a decade ago, or even in terms of present performance, will have to be steadily re-examined.

The problems I have outlined are not small ones. They never can be met through ordinary approaches. And it is for this reason that I have dwelt on them at an M.I.T. commencement exercise. I believe the time has come to bring to the attack on these problems the same kind of bold, aggressive, imaginative thought that characterizes the assault on the problems of science.

The layman's mind is fascinated by the daring of the scientists. The writers of science fiction have difficulty staying more than a few years ahead of the actualities of the laboratory or the testing ground. Earth satellites and space travel are now discussed in the matter-of-fact terms of a man talking about building a swimming pool – simply a matter of time and money. The incredible of today is the commonplace of tomorrow.

Not too many years ago, weird ideas having to do with something called "television," and others promising propeller-less airplanes, were greeted generally with indulgent skepticism. But times have changed. Today imaginative thinking has taken hold. Tell us that in 20 years we may be taking trips to the moon, and we are ready to buy a reserved seat on the first excursion. The scientist - the chemist, the physicist, the engineer - have taught us to accept imaginative thinking, and to lay aside our instinctive reaction that "it can't be done."

We need this kind of thinking in our development of human talents. We need it badly and soon. We need the creative imagination, the boldness, the refusal to accept the obvious or to recognize the "impossible." Our problems are big: they need big (Concluded on page 502)

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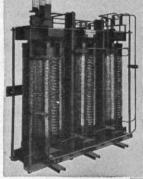


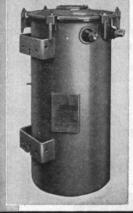
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LEADERSHIP THROUGH EDUCATION

(Concluded from page 500)

solutions. The objective of providing for a greatly increased youth population the type of elementary and secondary schooling which this country needs and deserves; the impelling need for finding ways to identify young people of above-average capability and motivating them to go on to post-high school education; the necessity for providing higher education for a student population twice the present size and for making certain that in doing so we do not lessen the quality of that education — these are problems that deserve and require the best thought of all of us.

I am aware that I have not talked to you members of the graduating class about the occupational problems and opportunities you will face when you, as they say, go out into the world. I have no monumental advice to give you. You are adults. You have been schooled in a great institution with great traditions and I recognize that you are perfectly capable of making decisions, setting your own standards,

and mapping your own course.

But what we have talked about today is — and will be — deeply meaningful in your personal lives. And therefore, if I may, let me just suggest that whatever else you regard as important henceforth you keep alive your appreciation of the greatness and the destiny of education in America. All over the country young men and women like you are graduating this month after having invested a part of their lives and a great deal of their energy and dreams in their colleges and universities. In the years to come, they and you will not want that investment to lose its value. Rather, the desire will be to enhance that value — to see the record and reputation of one's school maintained as an institution fully meeting the needs of the nation and of the times.

We are existing in a highly competitive world, wherein we are far outnumbered in sheer man power, so that we must put great dependence on the talents and abilities of our people. We need, therefore, to find accurate ways to measure the aptitudes of our school children, and then to guide and motivate those exceptional students who show capacity for the greatest intellectual growth. We must look to our colleges and universities to develop the gifted students that come to them. And we must maintain a group of vital individual colleges and universities with the responsibility of continuing to set high standards for all higher education in America. To do this, they must be able to keep their emphasis on the quality of the individual intellect while the pressures of quantity enrollment are rising.

These are problems to be met by all the American people. If educated men and women everywhere will seek and encourage imaginative thinking toward the goal of using our nation's talent to the full, they will be solved. No challenge in this competitive world will be too great, and we shall progress in confidence that the bright promise of

America's future will be fulfilled.



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SD's

M.I.T. Graduates

David Brown, 1940

John W. Colton, 1948

Robert S. Davis, 1955

Robert B. Egbert, 1941

Edward J. Fradkin, 1946

Manfred Gans, 1951

Ralph Landau, 1941

John H. Lutz, 1943

George J. Marlowe, 1950

Peter H. Spitz, 1949



SCIENTIFIC DESIGN COMPANY

BIOLOGICAL SCIENCES

(Continued from page 482)

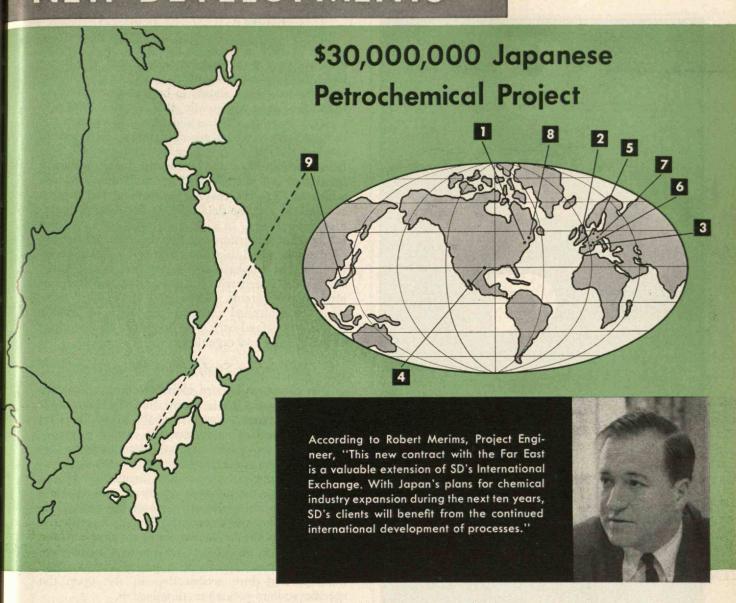
A very important advance in electron microscopy was made very recently by Professor Cecil E. Hall of the Institute's Department of Biology. Up to now it has been impossible to utilize the full resolving power of the electron microscope in examining objects, such as protein molecules, because the film material on which the molecules were deposited has a structure larger than that of the molecules to be examined. It is like trying to see a fishing pole lying in tall grass. If the pole were lying out on the road it would be very apparent but in the tall grass one may hardly see even its outlines. By utilizing the extreme smoothness of freshly cleaved mica, Professor Hall has succeeded in obtaining a surface so smooth that protein macromolecules only 15 Angstrom units (3/50,000,000 inch) thick have been seen directly. The molecules of nucleic acid - the primary substance of certain viruses and of the bearers of the genic determiners of heredity—have also been clearly demonstrated. The development of this method may forge the link so badly needed between descriptive electron microscopy and physical chemical methods of determining the shapes, dimensions, and properties of biological macromolecules (such as are being conducted by Professor D. F. Waugh). The need for this link is emphasized by the very important discoveries which have been made recently by x-ray crystallographers in determining the detailed configuration of the molecular chains which comprise such biologically important substances as the proteins and nucleic acids. It is the precise location of the individual chemical groups along these chains which causes these chains to assume their characteristic configurations (frequently that of a helix) and thus make possible the specific interaction properties which underlie biological function. Important advances in such crystallographic studies have been made at the Institute by Professor R. S. Bear.

The cell pays its debts for the chemical free energy which drives its various reactions in the currency of certain compounds, such as adenosine triphosphate (ATP), acetyl phosphate, and other substances which contain groups disposed in what has been badly named energy-rich configuration. By coupling the reactions of such substances with certain substrate molecules, with the help of specific enzymes extractable from tissues, biochemists have been able to make highly significant discoveries about the metabolic pathways by which biologically important substances are synthesized. In the Biochemical Division of the Institute's Department of Biology, Professor I. M. Buchanan and his associates have already made important contributions in this field, particularly with the biosynthesis of the purines.

Biochemists have discovered a very important way to get information about how the cell carries out its innumerable chemical reactions. This is by mechanically fragmenting the cells, separating certain categories of structures or partial systems in mediating the chemical reactions of the cell. In this way it was shown that the granules, called mitochondria, pro-

(Continued on page 506)

NEW DEVELOPMENTS



SD Has Complete Process Responsibility For Ethylene Oxide, Glycol and Cumene

In a move to regain Japan's markets in Southeast Asia, Mitsui Petrochemical Industries, Ltd., will build Japan's first major petrochemical project. Financed entirely by Japanese capital, this \$30,000,000 facility will be comparable in size of investment to the largest petrochemical plants in continental Europe—among them in turn some SD clients.

Three key units in the first phase of this project, scheduled for completion in November, 1957, will utilize SD processes for these basic chemicals. Ethylene Oxide by direct air oxidation of ethylene; Cumene by alkylation of benzene with propylene; Ethylene Glycol by hydration of ethylene oxide. In addition to designing and engineering these processes, SD will also oversee construction and supervise initial operation.

The second phase of the Mitsui pro-

duce dimethyl terephthalate and other chemical intermediates. A major part of this production will be used for the manufacture of synthetic textile fibres.

This is another example of how SD's "International Exchange" works. The ethylene oxide process, for instance, started in SD's American Laboratories (1); was developed in an English pilot plant (2); went on stream for the first time for Naphtachimie in France (3); shortly after was used in an American plant (4); another for Societé Chimique des Derives du Petrole in Belgium (5); an expansion of Naphtachimie (6); another European plant not yet publicly announced (7); the General Aniline and Film plant in Linden, New Jersey (8); and now across the Pacific to Japan (9).

with this project SD's cumene process takes its first trip abroad. In this country, the Barrett Division of Allied

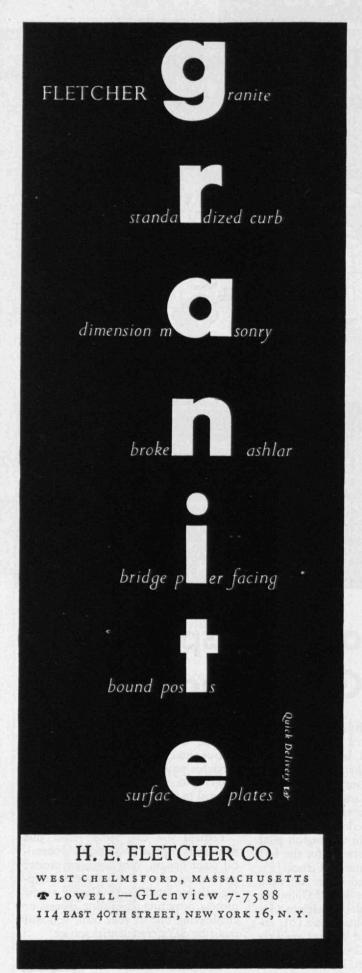
Chemical & Dye Corp. is now producing cumene in its SD-engineered plant. Mitsui chose the SD process because it produces purer cumene than any other known process. And the plant may be adapted to production of other alkylates, such as ethyl benzene and diisopropyl benzenes.

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BIOLOGICAL SCIENCES

(Continued from page 504)

duce the energy-rich substance ATP and are, therefore, the power plants of the cell. Other cellular fractions have been shown to be involved in biosynthetic processes. Apparently, this fragmentation permits the separation or fractionation of portions of the cellular factory which are still sufficiently intact to catalyze the reactions as they would in the cell. This being accomplished, the biochemist then proceeds to fractionate still further until the individual enzymes which catalyze the several reactions of the process are isolated and the details of the biochemical process are unraveled. In such analytical procedures lies the hope of understanding the chemical mechanism of the individual biochemical reactions. However, the biologist emphasizes the fact that in the intact cell, as contrasted with the macerated and fractionated partial systems, all the vital biochemical reactions are controlled and regulated so as to provide the adaptive, feed-back type of system characteristic of living cells and organisms.

Radioactive Study of Ion Movements

Application of modern electronic and radioactive tracer techniques have shown that the impulse is propagated along the surface of the nerve fibers by means of electrical eddy currents carried primarily by potassium and sodium ions. These currents flow or stop flowing (in a thousandth of a second) when the permeability of the surface membrane of the nerve fiber for these ions is raised or lowered. How this is accomplished remains one of the most challenging problems in present-day biology because the physical properties of sodium and potassium ions are so similar. This matter goes far deeper than bioelectric phenomena as such; it is probable that many hormone and drug actions depend also upon the

specific sodium-potassium distribution.

Nucleic acids (of which there are two general types) are intimately concerned with the specification of hereditary characteristics and also of normal and abnormal biosynthetic processes. Important advances in our understanding of the mechanism of action of nucleic acids have been made recently by studies of animal, plant, and bacterial viruses. These viruses have been shown to be composed of nucleic acid and protein. When a cell is infected by a virus - in some cases this seems to involve essentially an injection of nucleic acid into the cell - the chemical economy of the cell is commandeered by the virus (probably chiefly the nucleic acid). As a result, the cell seems to be compelled to convert its biochemical factory to the production of virus material (itself quite foreign to the infected cell protoplasm). The virus is thus propagated by the victimized cells and the infection is spread. What happens chemically and structurally when the long, thread-like nucleic acid macromolecules are introduced into the cell, which causes the host cell to produce exact copies of the foreign polymers, is unknown. This is a very central biological problem, indeed, not only because of its importance in medicine but because of its intimate relation to gene reproduction and the whole process

of replication. There seems to be some tendency nowadays to consider many types of derangements which produce disease states, particularly those such as cancer and the so-called metabolic diseases, to be due to virus-caused alterations of the biochemical economy of the cell which requires the cell to adopt new and pathological characteristics. Although, so far as I know, there is as yet little direct evidence for this view and although it would seem to involve a very broad definition of viruses, it is sufficiently suggestive to warrant careful consideration.

Future Prospects

The examples mentioned above illustrate some of the very challenging recent developments in analytical biology, biophysics, and biochemistry which will have great impact on experimental medicine and, eventually, on the health program. They will greatly aid man in controlling or adjusting adaptively to his physical environment. In a sense, however, many of these advances were the almost predictable results of the vast technical developments in recent decades. We may confidently expect further revolutionary advances in the coming years because we are still far from having fully utilized the technical and instrumentational potentiality already available to us.

However, we may well ask whether these developments may be expected to lead to important new conceptual advances perhaps as significant in their impact upon philosophy and our way of life as was the theory of organic evolution. Improvement in the physical health of the nation, valuable as that may be, is not enough if man is to adjust adaptively to the increasingly technological tenor of our times. Needed also is a deepened insight into man's inner nature and the forces which cause him to react as he does to his fellow man and to the rest of nature.

My crystal ball is, unfortunately, quite cloudy, and hence I am unable to sketch the precise direction from which such significant advances may come. If guesses are to be made, however, I should rely heavily upon the development of a new fabric of theoretical biology corresponding to the theoretical physics with its revolutionary advances now so familiar to all. In this, the physicist, chemist, and mathematician will play a key role. The growing interest of highly competent theoretical physicists in biological problems is a salutary indication that great advances may be expected possibly in our generation. From my own admittedly very inadequate experience in science and from examining a region of my crystal ball which is slightly less cloudy than the rest, I should suspect that a subject worthy of consideration by theoreticians is the nature of the specific interactions between highly organized systems at various levels of complexity from the protein and nucleic acid macromolecular systems mentioned above, to cells, organisms, and groups of organisms. At all events, I daresay that if we could come back a century hence to review progress in the life sciences, we would feel that the bioscientists of 1956, despite all the great advances of which they felt so proud, might have been more humble if they had had a bit more insight into the really revolutionary developments which were even then already in the making.



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JULY, 1956 507

FOOD AND AGRICULTURE

(Continued from page 480)

thetic compounds such as 3-indole acetic acid and related indoles, ethylene, acetylene, propylene, phenylacetic acid, beta-naphthoxyacetic acid, and 2,4-Dichloro-phenoxyacetic acid. Research in this area is being intensified and in the future spectacular new benefits may be expected. Such growth phenomena as photoperiodism, senescence and dormancy can probably be affected in ways as to improve production and to induce plants to grow over a wider range. It may also be possible to increase the quantity of desired storage products to a degree presently impossible through conventional methods. Thus in the future the combined efforts of plant breeders and agricultural chemists will be toward the tailoring of plant types to fit human needs and to control growth phenomena for improved yield.

Farm Chemurgy

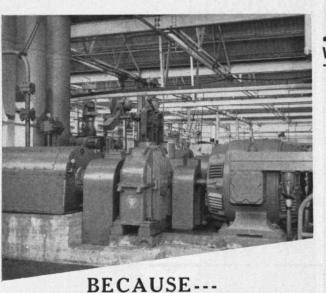
The role of farm chemurgy is an important one in assuring the most efficient utilization of large quantities of agricultural products and by-products. Each year new developments in this science result in bringing about greater use of plant and animal materials with economic benefit. At the same time the list of valuable chemical by-products which can be extracted from agricultural residues is growing.

There are four to six times as many tons of plant

materials produced annually on noncultivated land as through conventional agricultural practices. If marine forms are considered, these figures must be raised to the third power. Added to these resources are some 300 million tons of farm residues from plants and animals of which only a small fraction is utilized by industry. It should be feasible in the future to convert larger quantities of these potential food resources into forms useful in human diet as well as for the nutrition of ruminants and other animal forms. It is a well-known fact that rumen microorganisms can synthesize most of the vitamins in addition to carbohydrates, fats and proteins, and that ammonium salts and urea can supply a significant fraction of the protein required for animal growth. This permits greater use in feeds, of herbaceous matter, sea plants, and farm residues such as corn cobs and beet pulp, citrus pulp, bagasse, and even wood pulp when economical. Essentially this system is the ingenious utilization of the ability of bacteria and fungi to act upon nondigestible compounds with the production of usable quantities of usable protein substances. Efforts toward making multipurpose use of domestic plants and animals for the health and comfort of society are being rewarded to the extent that we can expect residues which are now wasted to become valuable agricultural assets.

Food Technology

Complementing advances in agricultural science (Continued on page 510)



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FOOD AND AGRICULTURE

(Continued from page 508)

and practice are those in food technology which has now grown to a multibillion dollar business. The transportation, storage, and processing of foodstuffs linking production to consumption has become a vast and far-flung industry which has produced enormous improvements in modern diet. These might be illustrated by comparing the American diet of 30 years ago with that of today, which on the average contains 15 per cent more calcium, 10 per cent more protein, 30 per cent more thiamine, niacin, and riboflavin, and 30 per cent more iron. Typical accomplishments in food technology include: (1) control of disease in transport and storage, (2) modern methods of food preservation, (3) sanitation and quality control, and (4) food and feed enrichment.

Natural cycles of agricultural production require that minimum quantities of foodstuffs be moved long distances during a relatively short harvest season. In the past, millions of dollars have been lost annually as a result of pests and pathogens attacking food products in transport or in storage. Modern methods of handling and the control of temperature and moisture, along with fumigation and chemical treatments, have markedly reduced the quantitative losses of stored foodstuffs as well as physiologic breakdown

with resultant reduction in quality.

Modern methods of food preservation are now being applied to enormous quantities of food much of which might otherwise be lost due to spoilage. These include the application of heat or cold; dehydration; physical action such as irradiation, distillation, comminution, vacuumization, and concentration; chemical treatments and fermentation. These techniques permit rapid and wide distribution of products which would otherwise have to be in storage for long periods, and in effect, transfer much of the storage problem to the individual home, which can readily accept a much larger share of this burden. An added advantage is the fact that treated foods retain their original quality for an indefinite period of time and essentially eliminate seasonal diets.

Progress is being made in sanitation and quality control. Present-day foods are purer, more nutritious, and freer from parasites and pathogens than ever before. This has been accomplished by the establishment of rigorous standards of purity and cleanliness and their general application to public food supplies.

Food and feed have been enriched. As the requirements for animal nutrition have become better understood, great improvements have been made in the nutrient quality of foodstuffs and in the preparation of balanced rations supplemented with minor elements, hormones, antibiotics, vitamins, and antiparasitic agents. This has made it possible to increase both production and quality of meat, eggs, and milk with economies in both time and money.

The enrichment of human foods has become commonplace in modern food technology. Riboflavin, niacin, and thiamine, vitamin D, iron, calcium and phosphorous are regularly added to cereal products and other foods. It is expected that a much wider

(Continued on page 512)



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FOOD AND AGRICULTURE

(Continued from page 510)

range of nutrient elements or compounds can be economically introduced into the average diet through the enrichment of foods without affecting flavor. Obviously this technique is most appealing in areas of the world where the variety of available foods is limited.

Obstacles to an Adequate World Food Supply

On the foregoing pages attempt is made to present evidence that there are available resources and knowledge which, if universally applied, would make it possible to feed a world population several times greater than the present one. By extrapolation it can be expected that future progress in agricultural and related sciences will make available those quantities of quality foodstuffs necessary to maintain adequate levels of public health. And yet, nearly two-thirds of the people in the world today receive less than the minimum essential elements of diet considered necessarv for normal health and vigor. This great gap between demonstrated agricultural potentials and actual production reflects the degree to which modern technology has outstripped the capacity of society to apply its benefits generally. Until this situation is remedied, even though estimates as to the potential world food production may be reasonably accurate, they cannot be realistic.

The vast differences in social development that exist between the more advanced countries of the world and those considered to be underdeveloped are in part the result of the unequal distribution of natural resources, climatic extremes and irregular topography. These and other factors have affected the distribution of populations and the development of agriculture and industry, and in consequence, local standards of living. Until recently the status of underdeveloped areas was only vaguely understood by society in general, but modern advances in communication and transportation have brought the situation into sharp focus. The growing fear that population pressures threaten world peace and the future wellbeing of mankind has resulted in public insistence that remedial action be taken.

During something more than a decade, there has been a growing preoccupation with technical assistance programs designed by nations or groups of nations to extend the benefits of science and industry into areas where the need is great. Many of these efforts have been soundly planned and well executed and have had important and useful impact on the rate at which local social and technical evolution occur. This is particularly true when such efforts take advantage of indigenous materials and customs so that progress made will be in terms of the economic, educational, and other capacities of the countries concerned. Violent permanent changes are rarely possible and usually undesirable. It is more realistic to recognize that changes in habits, traditions, and ideas are necessarily deliberate, and that these can only come after it is demonstrated that they are sound.

(Concluded on page 514)



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FOOD AND AGRICULTURE

(Concluded from page 512)

Even when assistance programs are highly successful, there will still be a considerable lag before the less developed nations can assume positions in the world community commensurate with the potentials of their human and natural resources.

Perhaps the greatest single need in the world today is for educational opportunities for those people who have been barred from avenues of communication and understanding by illiteracy. Education brings understanding, and with understanding come ideas and ideals without which real progress is impossible. Although tremendous contributions have been made toward alleviating the ills of the world through the application of medical, agricultural, and engineering science, progress in mass education has been relatively meager. It might be worth considering whether the major emphasis of assistance programs should not be on education and training rather than on more practical physical needs of underdeveloped nations. In the long run, each country will have to take primary responsibility for its own destiny; and therefore, the great urgency is to develop understanding and responsible leadership as rapidly as possible. It would seem that all nations have the obligation to assure that their citizens are learning as well as living, and that friendly efforts to help should be heavily accented on the development of indigenous human re-

Conclusions

From available evidence it can be postulated that if the physical and biological sciences are adequately supported, most of the factors adversely affecting the nutrition and health of mankind can be gradually overcome. This postulate is unsound, however, unless parallel developments in the social sciences and humanities are implicit in it. Otherwise there will continue to be a serious lag in time between scientific discoveries and their general application for the benefit of society. This gap will tend to grow larger in the future unless rapid strides are made in mass education and unless society faces the necessity of stabilizing populations. With these accomplishments, science and society can be more rapidly brought into phase and the future will hold commensurate improvements in living standards and health for an ever-increasing fraction of mankind.



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PROGRESS AT M.I.T.

(Continued from page 487)

one remarks to me to the effect that M.I.T. is a wealthy institution and therefore does not warrant contributions to the degree that many other institutions do. Such a statement seems to me to be a dangerous one and to reflect a serious misunderstanding of the character and responsibility of the Institute in the year 1956.

By what measure is M.I.T. a wealthy institution or by what standard does one appraise its wealth? The wealth of an institution is not measured in money but by its character, its excellence, its human resources, and its service. The money received by an institution or held in its endowment is simply a means for it to

provide and augment its services to society.

The financial resources of an institution are meaningful only if we relate them to the opportunities to serve society. M.I.T. is certainly in a position today where it is steadily called upon to increase these services and where it has the demonstrated potential to do so — provided it has the means. The need for more first-rate scientists and engineers as well as the need for maintaining an advancing and flourishing scientific activity in the United States are examples of what I mean. The financial resources of an institution thus are meaningful only if we relate them to its opportunities and obligations. In these terms, M.I.T.'s resources are modest indeed; in fact when we compare what we have the potential for accomplishing with (Concluded on page 518)

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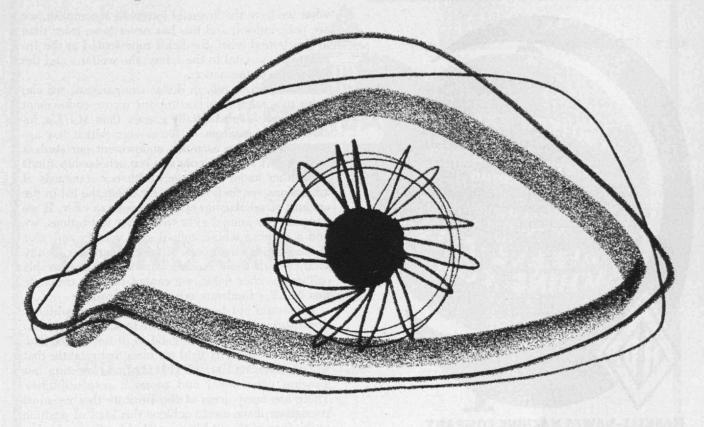
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PROGRESS AT M.I.T.

(Concluded from page 516)

what we have the financial means to accomplish, we are poor indeed; and this has never been truer than in this period when the fields represented at the Institute are so vital to the safety, the welfare, and the prosperity of the nation.

If we wish to talk in dollar comparisons, we can point to a number of institutions whose endowment per student is substantially greater than M.I.T.'s, including one institute of technology which has approximately twice as much endowment per student as does M.I.T. If we compare our scholarship funds with other major institutions with our standards of admissions, we find ourselves far down the list in the amount of scholarship assistance we can offer. If we compare our annual gifts with other institutions, we find a number whose annual gifts year in and year out are greater than ours. If we compare our faculty salaries with those received by men of comparable caliber in other fields, we cannot fail but conclude that M.I.T.'s funds are critically inadequate.

We would not be discharging our responsibilities in managing this institution if we took any lesser view than that it should be as good as, if not better than any institution in its field or, more importantly that we are realizing our full potential and meeting our growing educational and research responsibilities. There are many areas at the Institute that we must strengthen if we are to achieve this kind of position in the face of the ambitious and able efforts of other institutions.

I hope that M.I.T. never becomes so complacent or self-satisfied or impoverished of new ideas that it conceives of itself as having enough or that we ever set any lesser goal for ourselves than to be an institution of such adequate resources that we can really meet the demands upon us, that we can see our influence ever widening, our Faculty unexcelled, our facilities adequate to enable our staff and students to realize their fullest potential.

I am incited to make these observations because I think any attitude of complacency or any acceptance of the statement that M.I.T. is a wealthy institution in a monetary sense would tend to undercut the motivations and the ideals, the free enterprise, and the momentum which can make the difference between this being a great and vital institution and its declining into one which is pedestrian and static.

M.I.T. stands today at the very height of her powers and bidding fair, if she exerts herself vigorously and wisely further to augment her excellence, her productivity, and her leadership. She could slip from this eminence, too, if she — if we — fail to understand and to meet the increasing requirements our society exacts of its leaders, both institutions and men, or if she sets her sights too low and becomes content with little plans, limited aims, and paltry means. If our past really proclaims our future, we will not be satisfied being anything but the best and having the means to be the best.

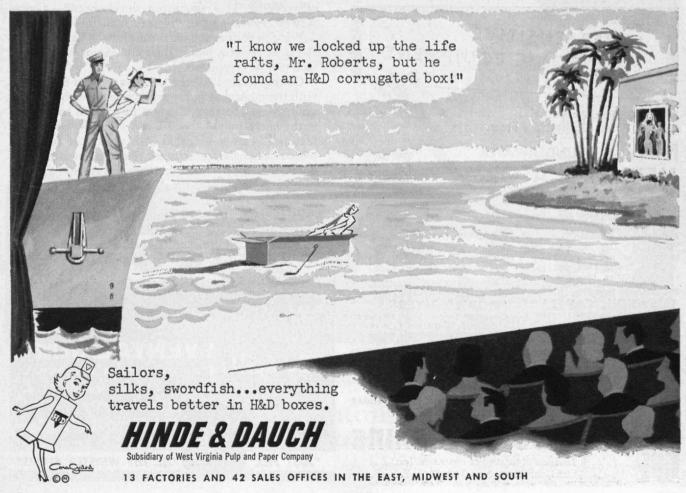


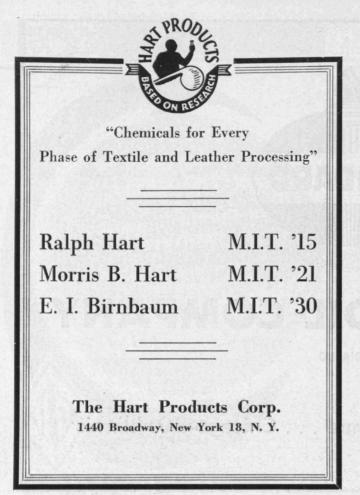


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SANITARY ENGINEERING

(Continued from page 478)

enteric infections, including protozoal, viral, and worm diseases. The enteric parasite burden of man has indeed been great. In this connection, it is of interest to recognize that the first international effort in sanitation that drew upon established scientific knowledge was made by the Rockefeller Foundation through its Sanitary Commission as a campaign for the eradication of hookworm throughout the world. Today health teams of the World Health Organization are busy in many lands with disease-control projects, a large number of which are sanitary engineering projects.

An unsolved problem of sanitation is the conversion of human wastes into safe fertilizers without destruction or loss of their manurial values. This is a matter of grave hygienic as well as economic importance. So far only in the most advanced designs of great sewage-treatment works and in well-managed composting of solid wastes has it been possible to capture the fertilizing ingredients of human wastes in an hygienically acceptable form. Yet much of the world is dependent for its crops on a full utilization of human as well as animal manures.

The conversion of the nitrogen content of sewage into plant protein through the medium of oxidation ponds, as part of the chain of sewage purification, offers a new means for recovery of useful waste substances. Through the release of carbon dioxide, bacteria in these ponds enable algal blooms to synthesize proteins from nitrogenous waste matters with the aid of sunlight. This promising development - a new way of harnessing the power of the sun - awaits the development of economic means for the harvesting of the algal growths before their conversion into animal feed can be completed.

Closely related to engineering activities concerned with the control of water and waste water have been sanitary engineering interests in aquatic recreation, in the harvesting of shellfish and other useful aquatic life, and in crops irrigated with sewage or fertilized with sewage sludge or other municipal wastes. The dominant concern in harvesting such aquatic and terrestrial crops remains the dissemination of enteric in-

fections by the crops.

The hydraulic skills of sanitary engineers early involved them in the control of the breeding places of mosquitoes that are vectors of disease. Drainage and (Continued on page 522)





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SANITARY ENGINEERING

(Continued from page 520)

filling of swamps offered the only permanent means of vector control until the discovery of new insecticides such as DDT. The development of this and related insecticides has made it possible to broaden the scope of attack upon malaria (until recently perhaps the principal killer of mankind) and to include vast regional schemes of control, such as those that are currently being conducted by teams of the World Health Organization in Asia and Africa.

Air — A Human Essential

Early interest in the control of the atmosphere and of indoor air for the health of man was erroneously directed toward the avoidance of noxious odors, miasmas, or malarias that were believed to be responsible for the dissemination of contagion. Not until the miasmatic theory of disease had been dispelled and the physiological relationships of air to man had been scientifically explored was the engineer in a position to devise rational means for adjusting the air of public buildings, workshops, and private dwellings to the needs of man.

Like water, man's microclimate is subject to physical, chemical, and biological contamination. But wider climatological conditions, too, have at times made larger air masses inimical to human health and comfort. The control of the atmosphere has involved a variety of engineering responsibilities. To prevent or hold in check the pollution of the air over great cities and industries, engineers have had to concern themselves with the proper combustion of fuels in moving as well as stationary units and with the hygienic management of numberless industrial operations from which airborne wastes are released to the atmosphere. The natural reservoir of air in the earth's envelope is so great and the substance itself so fluid that the effects of every day air pollution have generally not been marked and catastrophes such as those in Donora, Pa., and London have been mercifully few. However, inversions of the atmosphere have combined with industrial as well as traffic and home contaminants to envelop communities in chronic smogs that have defied direct remedy. The use of air-cooled nuclear reactors and the contamination of the atmosphere in the testing of nuclear weapons have placed new responsibilities on the shoulders of sanitary engineers and their fellow engi-

In the control of indoor air, air cleansing, air conditioning, heating, and ventilation are more and more made to satisfy the physiological needs of the occupants of enclosed spaces. Necessary engineering systems have contributed widely to human comfort and better health. However, the disinfection of the air for the prevention of communicable diseases that are spread by close contact between individuals has not yet proved itself effective under normal conditions of space occupancy. It remains a challenging problem. The control of industrial operations, on the other hand, has reduced dust and fume-borne occupational

(Concluded on page 524)



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SANITARY ENGINEERING

(Concluded from page 522)

disease markedly. The reduction of silicosis and related diseases in mining and other dusty trades is an example.

Food — A Human Essential

Numerous health hazards are connected with the conditioning, preservation, storage, preparation, and serving of foods. Among these, the large-scale industrial operations of conditioning, preserving, and storing foods have lent themselves to control by engineering means. This has been principally a matter of heat engineering. The canning, freezing, and dehydrating of foods and the large-scale pasteurization and bottling of milk are examples. New in the preservation of food is the use of radiant energy from nuclear sources.

Engineering analysis, design, and production of suitable machinery, together with the self-regulation of the operations of the food industry — both being based upon scientific knowledge of food contamination and spoilage — have made for a high degree of accomplishment in health protection. The preparation and sale or serving of foods in restaurants, food shops, and the like, require many small-scale operations. These are influenced by habits of personal hygiene that are not subject to engineering management. Poor standards of personal cleanliness have kept the number of food-borne epidemics extraordi-

narily high. Americans who venture outside the prophylactic precincts of the United States soon become aware of this.

Shelter — A Human Essential

In its relation to health, housing is a matter of proper heating, cooling, ventilation, illumination, water supply and drainage, provision of adequate space within the dwelling and adjacent areas, and the use of suitable building materials. In its attack on inadequate shelter, scientific knowledge is curbed very largely by economic restrictions. Many housing problems are sociologically determined. Factors in the environment impinge upon them, and the cooperation of engineers and sociologists is essential if available economic resources are to be put to best use.

Conclusion

It should be evident that sanitary engineering has accomplished much since it discovered its individuality and responsibility in Boston seventy years ago. It should be evident, too, that much remains to be done in preserving and promoting the public health and welfare by fitting an ever-changing environment to man. The ultimate goal of sanitary engineers, I like to think, is not alone a material one, however, but one that makes for a better life as well as better living and thereby becomes part of what President Killian has so aptly called "the art of making gentle the life of mankind."

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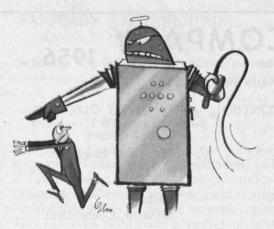
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SCIENCE AND HEALTH

(Continued from page 476)

planned in the Karl Taylor Compton Laboratories for team effort on the part of engineers, mathematicians, and physiologists for similar intensive interdisciplinary study of the human nervous system.

We cannot explore exhaustively the many byways into which these considerations lead us, but a few examples which typify today's research in health will perhaps lend specificity to these generalizations.

A study of the efficacy and value of high-energy x-ray electrons, for therapeutic use, has been under way for several years at M.I.T. This work has been directed in part at the sterilization of blood vessels and organs, leading toward new techniques of transplantation. Such work requires the intimate collaboration of the physicist, the physiologist, and the surgeon.

At the National Institute of Mental Health, the electrical behavior of the various portions of the brain have been mapped under varying stimuli by the simultaneous use of as many as 610 microelectrodes. With a fine electrode, less than a fifty thousandth of an inch in diameter, the electrical phenomena within single nerve cells are being analyzed in an effort to determine how nerve cells interact and communicate with each other. Here, working side by side, are the physiologist, the psychologist, the neurologist, and the physicist.

At Harvard, fundamental studies of stress and its relationship to adrenal function, steroid chemistry, psychic state, and physical exercise are under way. Here the biochemist, the physiologist, the psychiatrist, and the social scientist are teamed up.

At M.I.T. important research is under way in an effort to understand the way individuals and groups react to various methods by which information is presented to them. In this work, psychologists are applying certain of the concepts of cybernetics and of communications engineering. The results of these studies could well have a most important impact on our international relations as well as on many areas of domestic activity. It is significant, indeed, that M.I.T., which has been so long identified with physical sciences, has taken an active lead in developing the social sciences and particularly the relationship between the physical and social sciences. A striking evidence of this is its Center for International Studies, which, set amidst some of the greatest chemical, physical and engineering laboratories in the world, is concerned with those human factors that bear on man's most complex relationships with himself. It is possible, indeed, that the conceptual bridge between the brain as a physico-chemical system and man as a social being in a world framework is being constructed on the M.I.T. campus. The charter of the United Nations Educational, Scientific, and Cultural Organization states that wars begin in the minds of men. In due course, we shall perhaps know how this occurs and be able to prevent it.

Science must increase its scope, and pursue every lead intensively in order to accomplish its necessary goals in health and medicine. Research in this field

(Continued on page 528)

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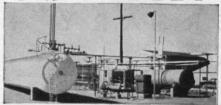
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SCIENCE AND HEALTH

(Continued from page 526)

is becoming "big business," involving intricate and elaborate apparatus, extensive organization, and a host of scientists and technicians. It is significant and encouraging that in the decade between 1945 and 1955 the annual expenditure on health and medical research in the United States increased from \$75,000,000 to \$240,000,000, derived from industry, philanthropy, endowment, and government. Congress and the Administration have continued to increase the appropriation to the National Institutes of Health for medical research. This is evidence of the widespread public recognition of today's need.

Science cannot limit itself to research, however. It must accept its share of responsibility for the social effects of its attainments. In so doing it must take responsibility for the prompt and orderly extension of the knowledge and its safe application in the improvement of man's relationship to his environment.

The World Health Organization is giving outstanding leadership in the extension of knowledge in the field of health. This great new agency, supported by 88 governments and functioning under the leadership and direction of the health professions, maintains a structure of 35 technical panels in a wide variety of fields related to health. Through these, as well as through expert committees and study groups derived from them, it correlates and consolidates current knowledge and world opinion, making such knowledge readily available in technical reports. Through seminars, conferences, surveys, and extensive programs of technical assistance - with at present 647 projects in some 110 countries and territories - it carries current health knowledge and practice to all parts of the globe, augmented by the extensive technical assistance program of our own government. The World Health Organization works intimately with other agencies, such as U.N.E.S.C.O., in the fundamental sciences and provides support to scientific congresses, largely through the Council for International Organizations of Medical Sciences. Through these efforts, the extension of scientific knowledge in health is no longer entirely haphazard. More and more it is a planned, orderly process operating on a world basis and reaching remote corners of the earth.

Sixteen years elapsed between the isolation of cortisone in the laboratory and the time it reached the public as an effective treatment for arthritis. Prednisone, discovered 20 years later, made the same trip in less than a year. This typifies the times.

The ultimate objective of research is to bring about change in conformity with man's needs and desires. Change has elements of danger, which must be recognized and dealt with. The engineer, whose job it is to effect change, has a particular responsibility in this matter and must practice what may well be called preventive engineering. This takes on particular importance today as huge hydroelectric and irrigation schemes and other major engineering works are being launched in remote parts of the world.

The conversion of basin irrigation in Egypt to perennial irrigation by construction of the Aswan Dam

(Concluded on page 530)

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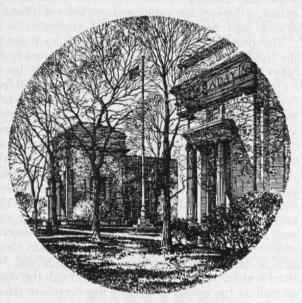
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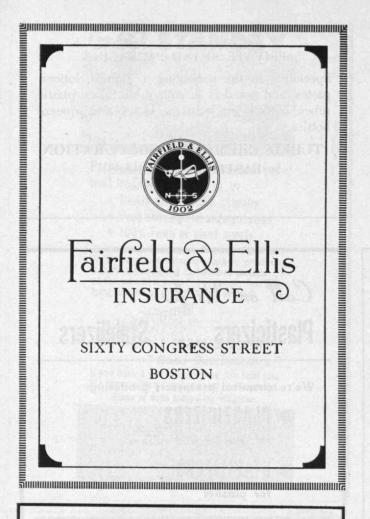
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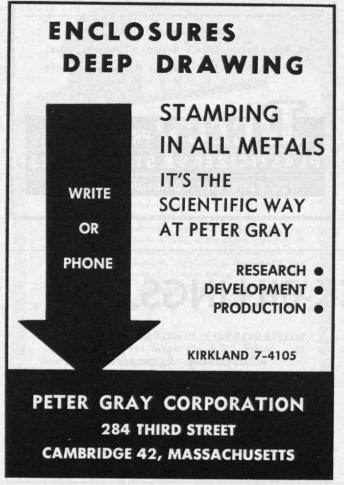
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SCIENCE AND HEALTH

(Concluded from page 528)

some 30 years ago resulted in an increase in the incidence of schistosomiasis, a chronic, debilitating, snail-borne infection, from an estimated five per cent to 80 per cent or more of the total population of Egypt. Consequently, careful engineering attention is being given to the prevention of snail propagation in the four-stage extension of the Aswan irrigation project associated with the proposed new billion dollar High Aswan Dam. Snails and the vegetation that supports them can be greatly reduced by thoughtful engineering, incorporating in initial plans preventive measures such as high-channel velocities; proper side slopes and channel sections; a proper regimen of irrigation, allowing for prolonged periods of channel drying; and provision for general sanitation.

The proposed development of the Volta River in the Gold Coast for the production of aluminum is another case in point. The dam-which will be at Adjena, now a small African village - will be 200 feet high, and the impoundment will extend 200 miles into the jungle. It is estimated that the permanent population in this area will increase from the present 35,000 to 100,000 persons, with mining activities attracting approximately 200,000 additional persons a year on a migrant basis. Two-thirds of the present population in the area suffers from a progressive, blinding, fly-borne disease called onchocerciasis. The protection of the new population in this primitive area depends on fly control effected by preventive engineering. This calls for cutting new stream channels in certain rapid sections of the river and for strict regulation of river discharges through the dam, as well as for proper design of the over-flow structures so that velocities of flow in hydraulic structures and stream channels are maintained at rates inimical to the propagation of the flies concerned.

In conclusion, as we look back at what has been accomplished in health through the contributions of science, we see evidence of great progress, particularly in the conquest of infectious disease. The benefits which we enjoy are being extended over the broad areas of the world, effecting a profound revolution in man's relationships to his environment. With this, have come problems of population density and the distribution of the world's goods. With it, also, has come a new vigor in the world's population. The density and the vigor, coupled with the knowledge that there can be a better life - a knowledge reaching out through the miracles of communication have created a restlessness that underlies the great ground swell of nationalism and the surge toward economic improvement which characterizes the world.

Therefore, it is necessary that the physical and the social sciences tackle these many problems in close tandem, utilizing the full range of available concepts and techniques so that man, searching at once the deep recesses of the cell and the complexities of man's group relations, may find his proper relationship to his changing environment. We share, I am sure, a full confidence that science can do this, and that it can do it well and in timely fashion.

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PHYSICAL SCIENCES

(Continued from page 484)

dose for the hepatitis virus, the lethal dose for many other readily demonstrable viruses had to be determined. This has been done for polio, mumps, rabies, herpes, vaccinia, and others. By interpolation, the required electron dose to control hepatitis virus in plasma has been estimated; at the same time examination of the electrophoretic pattern of irradiated plasma and animal studies have been shown that under the proper conditions of irradiation this dose produces only tolerable impairment of the useful properties of plasma. This work has about reached the point at which a clinical trial with human volunteers inoculated with irradiated hepatitis-contaminated plasma would be justified.

Dr. Hyde has spoken of the growing problem of degenerative diseases. One answer to localized degenerative and embryonic diseases lies in the replacement of the defective structure with human tissue obtained at autopsy. Such replacement tissue can be obtained free of organisms only with the greatest difficulty. During the past four years, in cooperation with Dr. Robert Gross of the Children's Medical Center in Boston and with other medical research groups, it has been demonstrated that streams of electrons traversing such tissue in the frozen state can destroy the organisms without adverse effect, that such electron-irradiated tissue can be banked for months and years, and finally surgically grafted into an unconscious but subsequently grateful recipient. The regeneration and construction of this grafted tissue by the intricate processes of nature is so complete that years later it becomes exceedingly difficult to distinguish the transplanted from the adjacent tissue. Many successful operations involving the replacement of sections of the aorta - the large vessel of the heart - and of the large femoral artery using electronsterilized autopsy material have been accomplished in recent years. The apparatus in Building 28 is currently electron-sterilizing several hundred such valu-

For nearly 60 years the control of neoplastic disease has relied primarily on two approaches, the surgical removal of the involved tissue or its irradiation by x-rays from a machine accelerator or by the gamma rays emitted from natural or artificial radioactive materials. X-rays produced at two million volts have been used in a cooperative program by the medical staff of the Lahey Clinic and M.I.T. for the past six years for the treatment of a wide variety of tumor problems. This work has contributed to the improvement of the methods of localizing the radiation effects to the tumor and has increased the precision and adequacy of radiation therapy. The acceptance of high energy x- and gamma radiations and the use of rotational methods of administration, though still in an early stage, is now virtually world-

able tissue sections per year for more than a score of hospitals who ship the dry-ice-packed unsterile tissue

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More recently, streams of high energy electrons have been added to the armamentarium of the tumor (Concluded on page 534)



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PHYSICAL SCIENCES

(Concluded from page 532)

therapist. Because of their relatively low penetration, compared to x-rays, these elementary negativelycharged particles have been found to be unusually suitable for the treatment of superficial lesions. In the simplest case such lesions, though malignant, may involve a single localized region of moderate size and limited depth. They can usually be controlled by conventional low voltage x-ray or by radium plaque treatment. In one case, the lesion was rapidly growing and near the eve; two million volt electrons in four treatments during one week brought about a highly desirable result - the complete disappearance of the tumor and the healing almost without trace of the involved regions. On the other hand, many superficial lesions are extensive and involve, in varying degree, all or nearly all of the skin. Such cases are often outside the capabilities of conventional x-rays and gamma rays but are still responsive to high energy electrons because of the relatively great efficiency with which they can be applied to the involved regions. Thus a newly available physical agent, applied with careful medical and physical control, leads once again to an improvement in an urgent human problem.

Those primarily interested in the physical sciences may be tempted to philosophize on this interaction of high energy electrons with living matter. Here an agent of the greatest physical simplicity - an elementary charged particle moving with known energy in a definite direction - applied to a system of the greatest conceivable complexity - the abnormally propagating tissue of a living human being complicated by inflammation and other secondary reactions - is able to initiate the return of this complex system to its natural harmonious condition.

But perhaps an equally important influence on the discipline concerned with human health has come from the method of analysis which characterizes the physical sciences, from their insistence on measurement and units of comparison, and from their technique of simplifying complex problems until the definitive factors become evident. These techniques of analysis and investigation, as much as any other thing, distinguish medicine of today from its ancient past. They account for the great value of premedical training at a technological institute; they are essential in the further advancement of the health and wellbeing of mankind.

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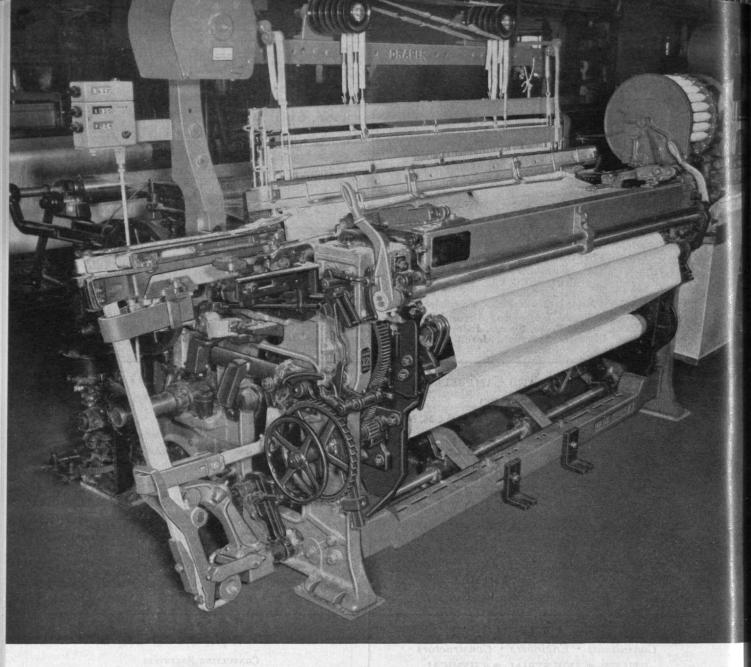
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Alumni and Officers in the News

Retiring. . . .

JAMES McGOWAN, JR.'08 from Campbell Soup Company after occupying all the top management posts. Having served successively as assistant general manager, production manager, director of research and development, and vicepresident in charge of research and development, he served as president from 1946-1953. Mr. McGowan has been chairman of the board of Campbell Soup Company, Ltd., of Toronto, Canada; and is also a trustee of Drexel Institute of Technology, director of Pennsylvania-Reading Seashore Lines, Philadelphia Manufacturers Insurance Company and a life member of the M.I.T. Corporation.

Advancing. . . .

FREDERICK E. Moses'07, a director of Textron American, Incorporated.

RALPH W. HORNE'10 to the presidency of Fay, Spofford and Thorndike, Inc., a leading Boston consulting engineering firm.

ROBERT C. Erb'17, the president of Melville Shoe Corporation, which owns the Thom McAn, Miles and John Ward shoe chains.

J. Justin Basch'17, Vice-president of Oakite Products, Inc., manufacturers of industrial cleaning and metal treating compounds.

JOHN J. MURPHY'23, Vice-president of Union Carbide Development Company, a new division of Union Carbide and Carbon Corporation.

JOHN T. BLAKE'24, Vice-president of Simplex Wire and Cable Company of Cambridge, Mass.

WILLIAM BAUMRUCKER, JR.'29, Vicepresident of Photon, Inc., Cambridge, Mass., announced by WILLIAM W. GARTH, JR.'36, President of the organization.

HAROLD G. MANGELSDORF'32, chairman of Standard Oil Comapny of New Jersey's advisory committee on human relations.

GLENN W. POORMAN'32, Vice-president of Esso Standard Oil Company. He has been a director of Esso Standard since January 1954, and was elected to the executive committee of the Esso board last fall.

JOHN STERNER'33, director of flight test operations, guided missile research division at Patrick Air Force Base for the Ramo-Wooldridge Corporation.

ROBERT R. WAGSTAFF'37, chief engineer of United Engineers and Constructors, Inc., Philadelphia, Pa.

ALRERT L. VARRIEUR'37, Vice-president of the Martin Company, Baltimore, Md. Mr. Varrieur was former general manager of the Denver division.

WILSON M. COMPTON, JR'41, President of the Cameron Machine Company, Brooklyn. The company was previously a privately owned corporation held by Mrs. James A. Cameron, widow of the founder, but has recently been purchased by a group headed by Mr. Compton.

RICHARD B. ENGLISH'10-44, general manager of Gulf-York, Inc., of York, Pa.

RUSSELL N. Cox'49, a vice-president of Cabot, Cabot and Forbes, industrial development firm.

EDMOND H. LEAVEY, former staff member in the Department of Military Science, elected president of International Telephone and Telegraph Company.

Honoring. . . .

BARNETT D. GORDON'16, President and Treasurer of M.K.M. Knitting Mills, Inc., Manchester, N.H., and RALPH LOWELL, Life Member of the M.I.T. Corporation, and President of the Boston Safe Deposit and Trust Company, who received honorary degrees at the June commencement exercises at Lowell Technological Institute.

THOMAS C. DESMOND'09 with two awards and engrossed citations; the 1956 Brotherhood Award of the Home of old Israel, New York City, and a 1956 Senior Citizens Award from the New York section of the National Council of Jewish Women.

R. G. RINCLIFFE'23, President of the Philadelphia Electric Company, an honorary degree from Pennsylvania Military College.

CHARLES S. DRAPER'26, the Navy's Distinguished Public Service Award, "for outstanding service to the U.S. Naval Establishment by his unstinted efforts and exceptional devotion to the solution of complex gyro dynamics and other technical problems related to the attainment of substantial improvements in marine navigation."

HERBERT F. GOODWIN'37, Assistant Professor of Industrial Management at the Institute, the Gilbreth Medal for 1956, "for his contribution toward the advancement of industrial management, especially in the field of Work Simplification."

VICTOR F. WEISSKOPF, Professor of Physics at M.I.T., the nominee by Berlin's Max Planck Institute to receive the next Max Planck prize. Dr. Weisskopf will be the third recipient of this new memorial award. He is also the recipient of a travel grant from the National Science Foundation to attend a conference on basic nuclear research in Moscow.

ROBERT B. WOODWARD'36, previously noted for his part in the synthesis of

quinine, cortisone and strychnine, now reports the total synthesis of reserpine, a "tranquilizing agent" used in the treatment of high blood pressure and nervous and mental disorders. Hitherto, reserpine has been extracted only from Rauwolfia Serpentina, an Indian plant, which has been used as a sedative since ancient times.

Obituary

CLYDE W. HOLLIDAY'91, May 30° FREDERICK C. MOORE'91, May 8 EDWARD R. WAIT'91, May 1951 CLARANCE E. FULLER'93, September 9, 1955°

EARL S. JENCKES'94, April 4° JOHN W. COOKE'95, March 1946° PERLEY F. GILBERT'95, May 5° ARCHER E. WHEELER'95, March* LEON W. MANSUR'96, March 3° WALLACE McCrea'99, April 5, 1954° Louis A. Sohier'99, April 4 CHARLES E. BALDWIN'00, May 10° MAURICE DAVENPORT'00, April 1° JEAN B. McIver'00, January, 1955* NATHANIEL SPRAGUE'02, March 28° CHARLES H. ROBERTS'03, January 23 HARRY H. GROVES'04, May 15 HARRY W. SHERRILL'04, April 9 SUMNER G. DAVENPORT'05, March 7 HAROLD K. MUNROE'06, May 28° HOWARD W. KEY'06, January® GEORGE CONRAD WESTERVELT'06, March

MALCOM G. WRIGHT'06, April 30° MATTHEW NORTON HAYES'08, January 19°

UTAR J. NICHOLAS'08, April 14, 1952 JAMES I. FINNIE'09, February 12° WILLIAM T. ROBERTS'10, Date Unknown LELAND D. WOOD'11, March 20° HERBERT J. VON ROSENBERG'13, December 6, 1955°

Bradley T. Ross'13, April 26° Nathaniel M. Sace'13, May 14° Joseph A. Summerville'13, December 20, 1955

ROBERT CHILD DOREMUS'14, March 18° THOMAS A. BERRIGAN'16, May 11° FRED F. GLEN'16, Date Unknown PHILIP L. HUNT'17, Date Unknown HAROLD A. KNAPP'17, January 19° EDWARD J. SHIELDS'18, April 11° RUSSELL S. SMITH'19, April 11° CATHERINE D. WITTON'20, March 15° HERMAN HENRY POHL'21, March 13° PAUL J. ROCHE'23, In 1925 JAMES S. WOODWARD'25, March 29° MARY SOROKA'26, Date Unknown* IDA M. Lewis'28, November 11, 1955* PIEN CHUN HUANG'31, April 1935 ALLEN TALCOTT'32, Date Unknown IOHN GUSTAFSON'32, Date Unknown WILLIAM L. BELL'33, March 19° MALCOM S. McIlroy'47, March 4° WILLIAM E. SCRIBNER'53, April 19, 1955

Further Information in Class Notes

News from the Clubs and Classes

CLUB NOTES

Boston Luncheon

The Boston Luncheon Club held its final meeting of the 1955-1956 season on May 17. More than 100 members and guests were present to hear a most interesting and enlightening talk on "M.I.T. Highlights in Brief" by James R. Killian, Jr., '26, President of the Institute.

Dr. Killian reported that, according to a recent survey of 391 American colleges, the Institute is sixth in donations by Alumni and fourth or fifth in the value of endowments and other permanent funds. In spite of this excellent record, M.I.T.'s increasing national responsibility for training engineers and scientists as well as its research and development programs calls for even more funds.

Some of the recent developments at the Institute were touched upon briefly. Among these was the establishment of Course XXI, the new course in the School of Humanities and Social Studies whereby a student, after five years of study, may receive a Bachelor of Science (general) plus a professional degree.

Another noteworthy achievement is the expansion of the Music Department resulting in greater participation by members of the Institute family. This summer the Choral Society, under the direction of Professor Klaus Liepmann, will go to Germany where they will give several concerts. A very valuable addition to the musical facilities is the recent installation of a new organ in the Kresge Auditorium.

Since the chapel has been completed, an excellent religious program has been instituted under the direction of Dean Bowditch. On the average, 18 religious services have been held in the chapel each week. The Institute, while remaining strictly nonsectarian, has welcomed all bona fide religious groups.

A committee headed by Edwin D. Ryer '20 has made a careful study of the long term program of housing at M.I.T. The recommendations of this committee were summarized on pages 413 and 414 of the June issue of The Review.

Among the forthcoming facilities at the Institute are: (1) An electron accelerator for research to be financed jointly by Harvard and M.I.T.; (2) the nuclear reactor for research and for training nuclear engineers; and (3) a computation center in connection with the Karl Taylor Compton Laboratories. (The I.B.M. computing machine will be available for use on three shifts: one shift for M.I.T., one for other New England colleges and one for the I.B.M. Company.)

Thirty-eight special programs for adult education will be conducted this summer in which approximately 2000 men and women will participate.—George A. Parkhurst'36, Secretary, 1284 Soldiers Field Road, Boston, Mass.

Southern California

An excellent luncheon meeting was held on May 17 in the pleasant atmosphere of the Cabrillo Room of the Jonathan Club on South Figueroa Street in Los Angeles. This occasion occurred concurrently with the annual convention of the American Institute of Architects and so many Alumni from other parts of the country who were in Los Angeles for this convention were able to attend our Club luncheon.

The Club was fortunate in having as speaker John E. Burchard, Dean of the School of Humanities and Social Studies at M.I.T., who spoke on "Interplay of Science and the Arts in Modern Life." Dr. Burchard turned out to be a most entertaining and interesting speaker. The more serious part of his talk emphasized the difficulty the universities are having in holding good men who can do well in industry. He also discussed the problem in which M.I.T. is presently engaged in arriving at a balance between the practical and the theoretical in the undergraduate curriculum which would mean leaning more toward theory at a sacrifice of specialization. Specialization would then come to the fore in graduate work, the net result being a general increase in formal education.

All in all, the meeting was fully enjoyed. Those attending were: R. B. Atkinson, Mead Bolton, Robert Breyer, Gates Burrows, Walter Campbell, B. S. Coleman, Jack Duffin, Robert Gardner, Carney Goldberg, B. S. Gruzen, Roger Hayward, W. S. Hertzka, Maxwell Kaplan, F. K. Koerner, Gustave E. Kidde, Mr. Littlefield, David Long, Bill MacCallum, Gene Maginan, Joseph W. Marshall, F. O. Merchant, Elwin L. Noxon, L. N. Reynolds, J. W. Reis, W. S. Shamban, Burnett Turner, A. F. Wagner, Bob Welles, H. E. Whittmore, and Jay Zeamer.—Jay Zeamer'40, Secretary, 8109 Creighton Avenue, Los Angeles, Calif.

Cleveland

On April 26, 1956, the Cleveland Club enjoyed a most unusual treat: an address by Professor Donald P. Campbell, of the M.I.T. Department of Electrical Engineering. Dr. Campbell was described to us in advance as an expert on automation, and he certainly was that, plus a great deal more. He kept his audience of about 70 members spellbound with a fascinating discussion of the problems of materials and information handling in business and industry. He described, with numerous illustrations, the manner in which new techniques and developments in the handling of materials could be applied to industrial processes.

New officers of the Association were also elected at that meeting, as follows: President, S. Floyd Stewart'24; Executive Vice-president, Herbert J. Hansell'46; Secretary, J. P. AuWerter'38; Assistant Secretary, Paul M. Heilman II'44; Treasurer, Ernest P. Klipfel'48; Assistant Treasurer, Thomas E. Weil'49.

At this writing plans are under way for a social meeting in June. If those plans materialize, announcements will be sent to all members.

The contemplated directory of M.I.T. Alumni in Cleveland is also in process of completion, and probably will be available sometime during the summer. — J. P. AuWerter? 38, Secretary, Atlantic Automatic Company, 18502 Syracuse Avenue, Cleveland 10, Ohio.

Fairfield County

The spring meeting of the Club was attended by 34 members with dinner at The Clam Box, Westport, Conn., on May 15. A nominating committee was appointed to present a slate of new officers at the fall meeting. The guest speaker was Donald P. Severance'38, Secretary-Treasurer of the Alumni Association, who spoke briefly on current items of interest at M.I.T., and presented a sound, color movie describing the SAGE System of continental air defense. — D. W. WATERMAN'39, Secretary, 99 Flat Rock Road, Easton, Conn.

Hartford

The spring meeting of the Hartford group was held on April 26, 1956, at Howard Johnson's in West Hartford. Our speaker was Charles H. King, Jr.,'41, head of the combustion section at United Aircraft Research. Charlie is the first president of the Connecticut Valley Section of the American Rocket Society, and spoke to us on rockets. The majority of the 44 in attendance were initiated to a fascinating field of research and accomplishment; the remainder of the gang seem to be working on these gadgets.

Plans are being made for the June outing, which will be a happy memory by the time these notes are printed. But the Secretary would like to request that those Alumni in the area who are not being reached by our announcements should contact him immediately. — RICHARD M. FEINGOLD'43, Secretary, 49 Pearl Street, Hartford 3, Conn.

Kansas City

Ten Alumni from the Greater Kansas City area met on May 9 to reactivate the M.I.T. Club of Kansas City. The newly elected group of officers are: Richard Muther'38, President; J. Warren Evans '39, Vice-president; Bernard J. Duffy, Jr., '44, and Frederick G. Lehmann'51, Co-Secretary-Treasurers.

Warren Evans will serve as chairman of the program and arrangements committee. Paul Gibson will be chairman of the membership committee. Plans call for three or four meetings a year, starting next fall. All Alumni in the Kansas City area will be on the mailing list and will receive notice of our fall meeting well in advance. If there are any in this area who haven't kept M.I.T. up to date on your

address, drop a post card to me.— Bernard J. Duffy'44, Secretary, c/o Standard Oil Company, Sugar Creek, Mo.

Northern New Jersey

The final general meeting of the year was held on May 16 at the Anheuser-Busch Brewery in Newark, N.J. After a tour of the manufacturing operations, the group adjourned to the magnificent barroom on the premises, for a convivial evening of movies, beer and pretzels, and a brief business meeting under President Westerhoff.

The following were unanimously elected to serve as officers and members of the board of governors of the Club for the ensuing term: President, Donald H. Spitzli'27; Vice-president, Stuart G. Stearns'39; Secretary, John T. Reid'48; Treasurer, Joseph Wenick'21; governors for three years: Donald Green'26, Jack F. Andrews'33, Clayton D. Grover'22.

Treasurer Joe Wenick reported that, with 244 members, last year was the second best year in the history of this Club. There was an increase in cash status as of the end of the year amounting to \$175.00.

In spite of this sanguine report from the Treasurer, the board of governors recommended that the Club face up to the fight against inflation and rising costs, and raise the Club dues to: Sustaining members \$10.00; Active members \$5.00; Active members of the last graduating class \$3.00. The recommended dues structure was adopted by the Club membership.

Treasurer Wenick also reported on the Club's scholarship program, where 52 members gave \$438.00 this year. With the balance left over from last year, less printing and postage, this leaves \$530.00, which is more than enough for the \$500.00 scholarship planned for this year.

STUART G. STEARNS'39, Secretary, 25 Elmwood Place, Short Hills, N.J. JEROME E. SALNY'37, Assistant Secretary, Egbert Hill, Morristown, N.J.

Puerto Rico

The M.I.T. Club of Puerto Rico held a meeting at "La Esperanza" beach, Central Mercedita, Ponce, on June 3, 1956. General matters were discussed and lunch was served by Club Deportivo, featuring fruit cocktail, "arroz con pollo," "hallacas," salad, custard and coffee. After lunch we stayed at the beach up to 6:00 P.M. enjoying swimming, dancing and savoring drinks, graciously served by Destilería Serralés. — ULISES B. LOUBRIEL '55, Secretary, Box 9447, Santurce, P.R.

Sao Paulo

The M.I.T. Club of Sao Paulo held its General Meeting on April 24, at the Sao Paulo Athletic Club.

The main item of business was the election of the new governing body. Allen Velho'39 was elected to the presidency of the Club for the next two years, while Heinz Gunther'52 was elected to replace Allen in the office of vice-president. Marc L. Aelion'51 was drafted for another two-year term as secretary-treasurer.

Present at the meeting were Adolopho Santos, Jr., '24, Jorge Johnston' 32, Gunner Orberg' 42, Hanns Maier' 44, Oswaldo Torres' 45, Victor de Mello' 46, M. Ryan '47, Rogerio Rego'47, Marc Aelion'51, and Heinz Gunther'52. — Marc L. Ae-Lion'51, Secretary-Treasurer, Labor Terapica S/A, Caixa Postal 2240.

Washington

The final dinner meeting of the 1955-1956 social season will feature a special event of unusual appeal. An M.I.T. Alumnus in the Washington area who has achieved exceptional success in his field of engineering has generously consented to escort us through his company's engineering laboratory, following a dinner at the company's modern cafeteria and a brief talk on how he achieved his present position. We will be especially pleased to present Thomas K. Meloy'17, who will address us on the subject of "Melpar and the M.I.T. Graduate" and conduct us on an inspection of the engineering laboratories and model shops of his company, Melpar, Inc. Mr. Meloy, President of Melpar, is a graduate of Harvard University and Ecole des Ponts et Chaussees, Paris, in addition to M.I.T. During World War I, he served in the Corps of Engineers in the United States and Europe. During World War II, he directed laboratory and manufacturing facilities for the development of radar, anti-aircraft, submarine warfare equipment and fire control equipment. Melpar, Inc., now a subsidiary of Westinghouse Air Brake Company, was founded in Washington, D.C., in 1945, by Mr. Meloy, with the purpose of engaging in electronics research and development. It expanded rapidly with additional offices and plants being established in Virginia and Massachusetts. The Virginia operations were recently consolidated with the construction of the ultramodern laboratory and model shop building in Falls Church, where Melpar is performing advanced research and development programs in the field of electronics which are vital to the defense of our country.

At this final meeting of the year the officers who will manage the affairs of the Alumni Club next year will be elected. The nominating committee, headed by Albert F. Bird'30, will present a recommended slate of officers. Charles H. McDonnell'48, Vice-president of the M.I.T. Club of Washington, has just been appointed by the ACF Nuclear Products Division as project engineer for the M.I.T. Reactor. — Andrew F. Hillhouse'43, Secretary, Solar Aircraft Company, Cafritz Building, Washington, D.C.

CLASS NOTES

· 1891 ·

On February 14 I received a long, explicit letter from our president, Harry Young and in it he wrote, "Gorham tells me now that he has had some sort of a shock and will be unable to continue acting as secretary; and the most important thing is that both Gorham and I have decided that you should take on this job of Secretary of the Class." I protested, but to no effect, so I am your pinch-hit Secretary until our annual meeting, June 9.

My first word from Gorham was a post

card in his own hand, and it read: "Many thanks for your kind note of February 29. My health is improving and my doctor tells me I have had a nervous breakdown, but it should clear up in about a week. I congratulate you on your wonderful recovery and I hope to see you some day." He writes me about every week concerning the Class, his health or his interests. On April 22 he sent a letter from our fellow member, Robert Ball in England, who said; "Some of my friends in the old First Parish Church have urged me to rebuild the basement of Pierce Hall as a Dana Memorial, and I am planning to do this. Kindly Greetings, Gorham." Here is Ball's letter: "I am very sorry to hear of your nervous breakdown and trust that the coming of spring weather will hasten your recovery. If you had been here during the winter you would welcome spring with open arms for we have had a very cold winter and with unusually low temperatures for this climate. Alas, the snow does not lie long enough to afford such sports as we used to indulge in on the heights around Boston. You will remember the antics you played while whizzing down the steep slopes and then the toil upwards to the top for another run which restored the blood heat. Now we must leave such fun to the boys in Tech!

"My daughter, who lives in Kenya, South Africa, is in a climate that knows no snow, but there are other things that keep them occupied, among them the Mau Mau disturbers of the peace. But they are not as active as formerly and no doubt will be suppressed eventually. Her husband is a civil engineer and is chiefly concerned with hydraulic problems. Close to where my daughter lives there is a soda lake which discharges clouds of vapor when the water level is low and the edges exposed. This is one of the drawbacks."

Gorham tells me that he has heard from one of Frank Howard's sons who says that Frank is in about the same condition. We are all eagerly interested in both Gorham and Frank and we do hope we may see them at our 65th Reunion on June 9.

I regret to be obliged to record the death of Clyde W. Holliday who formerly resided at 161 Howard Avenue, Passaic, N.J. He passed away just 12 days before our last annual reunion and the information comes to us by a letter of his sisterin-law which follows in full: "As the affairs of Clyde W. Holliday are in my hands, your letter to him with request for a reply has been received by me. I am Clyde Holliday's sister-in-law and it is with deep regret that I tell you that he passed away May 30, 1955." Clyde was a member of the Baltic Lodge of Masons, Brooklyn, and the Philatelic Society of Passaic.

And from Cumberland, Me., we hear news of Joseph Warren. "I was glad to receive your letter of the 9th. It is good of you to take over as Secretary of the Class of 1891. I hope that all the members feel as well as I do. Because of my age I have given up many things I used to do, like driving my car for one thing; so that I can't drive to the annual dinner as I formerly did, but I will make an effort to attend the June 9 meeting. I

think that my daughter will furnish transportation. I am retired since January 1, but have the privileges of visiting my old office in the mill, which I do several times a week."

In the act of mailing these notes to The Review office I received this important letter from Frank Howard, and here it is just as it comes to me. "Your letter of March 26 is at hand. I was not able to answer it more promptly although I very much wanted to do so. Your automobile accident of last September gave me great concern. It must have been rather serious if you are only just trying to walk now. I am full of sympathy for you as I am not able to walk or write and cannot see any prospect of my doing so, perhaps ever. I suffered a paralytic shock last July and am quite helpless.

"I feel that Harry Young and Gorham Dana made a wonderful selection in choosing you for our Secretary and I think it was perfectly grand of you to take on the job. For your information, let me say that Henry Fiske had collected items of Class interest and these are now in my possession. When you are getting around again you may be interested in looking them over. I have enjoyed doing so. There are pictures and programs and so forth of interest to the Class. Harry Young knows that I have them and I have written urging that the Class decide what disposal should be made of them but have had no reply. I can hardly imagine that they would be of any general interest after our Class membership has dispersed.

"I think Harry Young has talked with some of the M.I.T. officers about setting up a storage space to house anything that

might be of general interest.

"I am very sorry but the matter of attendance at the '91 gathering is absolutely out of the question; but I will be thinking of you all."—CHANNING BROWN, Secretary, 36 Foster Street, Littleton, Mass.

· 1893 ·

Notes for the July issue of The Review are due on May 14 – too early to report any news of the Class Reunion to be held at the Faculty Club on June 11. We are hoping that a goodly number of the Class will be able to attend the Reunion.

We regret to report the death of Clarence E. Fuller of Boston on September 9, 1955. The news was received from the Alumni office on April 23. Classmate Fuller will be missed at the Reunion on June 11, as he has been one of the "regulars," and always appeared to enjoy the yearly luncheon meeting with his Classmates. — George B. Clidden, Secretary; Gertrude B. Currie, Assistant Secretary, c/o Fay, Spofford and Thorndike, Inc., 11 Beacon Street, Boston 8, Mass.

· 1894 ·

Happy spring is here again, also the time to get Class Notes off to The Review, so here is the meager contribution for this issue. The Secretary and his wife flew to Los Angeles on March 27, especially for the annual meeting of the Refrigeration Research Foundation of which your Secretary has been chairman of the board of governors ever since the foun-

dation was organized in 1943. I cannot seem to get dis-elected, if that is the word, nor will a resignation be accepted. One high spot of the meeting to me was the announcement of an M.I.T. graduate student as the first holder of the graduate scholarship created last year and named in honor of one Prescott, as previously reported. I hasten to state that I had no part in the selection of the winner, and the information came to me as a complete, but nevertheless most gratifying surprise.

Our stay in the Los Angeles area was made most enjoyable as we were guests of the P. K. Bates'24 for 10 days, during which time we also had an opportunity to visit Colonel and Mrs. Vestal. He was formerly head of Military Science at M.I.T. The colonel and your Secretary celebrated their birthdays, April 5 and April 6, appropriately for men of 84 and 83 respectively. After the three day meeting of the foundation at the Statler, we flew to San Francisco and spent three days with the Hugh Griswolds'29, at Burlingame, who took us to spend most of an evening with Jack Nowell and his hospitable wife at their lovely home in Hillsborough. Jack is still very active and seems to lead a very full life, although he has cut out some of the civic responsibilities which he generously gave to the community in the early days of his retirement. It was a great pleasure to the Secretary to talk of classmates, grandchildren, great grandchildren, and affairs of state, and Mrs. Nowell is always a most charming hostess. We ended our bay area stay with three days at Berkeley, where we took our very dear friend Elsie Sperry, widow of our Austin, to dinner and had a call from her on the following day. Professor Crues of the University of California entertained the Secretary at a luncheon at the Faculty Club at which other friends were met. Another one-day flight brought us back to Boston, after an absence of three weeks.

It is always a sorrow, but in recent years a frequent one, when the Secretary has to report another break in our ranks. Earl S. Jenckes of Wyomissing, Pa., died on April 4, at the Holy Cross Hospital in Fort Lauderdale, Fla., where he had gone for a vacation. Jenckes was chairman of the board of the Fairy Silk Mills, Shillington, Pa., of which he had been appointed receiver in 1934, and had then put the company on a successful basis. In 1941, he was made president of the company, and so remained until 1954, when he became chairman of the board. He attended our 60th Class anniversary in that year as some will remember with deep pleasure. Jenckes was born in Woonsocket, R.I. on May 9, 1872, son of the late George W. and Martha Jenckes, and entered M.I.T. in 1890, where he took the course in Mechanical Engineering, but left before graduation. His first position was with the cotton mills in Woonsocket but later joined the Draper Company, manufacturers of cotton machinery, as sales representative, making five trips to Europe while in this position. Later he was affiliated with the Whitins Mill at Northbridge, Mass., and in 1910 joined the firm of Joseph Bancroft and Sons Company of Wilmington, Del., and rose to the presidency of its Pennsylvania division, retiring in 1930. He was a member of the Universalist Church, the Wyomissing Club, and the Berkshire Country Club. He is survived by a daughter, Mrs. Wendell T. Jay and a son, George A. Sr., both of Wyomissing, four grandchildren and eight great grandchildren. The Class has lost a deeply respected and worthy member.

Thanks to O. B. Denison'11, it is a pleasure to report from a clipping in the Framingham News of May 1 that Henry E. Warren was one of the participants in Old Timers night, held by the Algonquin Council, Boy Scouts of America. Henry is a member of the executive board and trustee committee. This is merely another of the many services which he is constantly doing for the welfare of the public, in one way or another, for his life has been filled with good and unselfish works, as well as with very high grade technical and business affairs.

George Owen, although past 85, is still busy professionally especially, at present, in the modernizing and conversion of the rigging of small yachts, for he reports that more persons are now sailing than ever before. George was one of the guest speakers at a yachtsman's dinner recently held at the St. Botolph Club, the other one being Vanevar Bush'16, who has now retired as president of the Carnegie Corporation and has built a new home in Belmont. Another Tech man, Alan Bemis, '30 was in charge of this enjoyable occasion. George is also often sought to give the charge at installations in the Masonic lodges in this area, a service which he renders with impressiveness and satisfaction to those privileged to hear him. He also represents our Class on the Alumni Council most worthily. Classmates, please send news items about yourselves for the first autumn issue. - S. C. Prescott, Secretary, 16-317, M.I.T., Cambridge, Mass.

· 1895 ·

Death takes its toll as we pass thru the years of 50-60-70-80 and over! This passing is an inevitable happening in life, yet we exceedingly regret to record such events in our 1895 necrology records. Two of our mates have passed on, both during the month of March: John W. Cooke, and Archer E. Wheeler. John Williamson Cooke died in March 1946 as we learn from the records of the Alumni Association. Shortly after graduation he entered the employ of the Boston Edison Company and engaged in power station work with Charles Parker, M.I.T. Course II. He became familiar with the operation of storage batteries which eventually became his specialty. In October 1900 he was operating engineer for the Boston office of the Electric Storage Battery Company and finally became sales engineer for this company. In February 1916 he was storage battery engineer with the Electric Boat Company, dealing with difficulties experienced with submarine storage batteries. It was found that such troubles could be corrected at the factory of the battery makers. In March 1917, he was on the staff of the Gould Storage Battery Company. During the first World War, batteries were manufactured for about 30 submarines, one of which, the U.S.E2, held the record for traveling submerged in the war zone. After World War I, attention was given to house lighting batteries for farms.

Archer Estes Wheeler who died in March last had been with our Class for three years (1892-95), Course III. We have had little information as to his business connections during past years, and can only quote from The Review of July 1918: "Archer E. Wheeler, consulting engineer for the Union Miniere du Haut Katanga, has recently gone to London to submit alternative plans for the metallurgical treatment of a large body of oxidized ore occurring on their concession in the Belgian Congo near Elizabethville." We are indebted to Professor C. B. Haywood for the information as to Wheeler's passing. We recently learned from an item in the Public Spirit of Ayer, Mass. that Perley F. Gilbert, Course IV, architect in Lowell, Mass. passed on at the age of 87, on May 5, 1956. We hope further information may be reported in the next issue of The Review.

"Our Al Sloan" has resigned his position as Chairman of the Board of General Motors, but will still be active as a director. Sloan started with General Motors in 1918 and for 38 years "he served the corporation long and magnificently." His success was due to his abilities as an administrator. He built a management team that is second to none. His policy was one of decentralizing administration, but centralizing policy. He put the most capable executives in charge with responsibility and from these executives were developed the team and future top men of the corporation. He has been making large and personal contributions in money and time in seeking a cure for cancer, and in furthering education. Sloan was 81 on May 23, 1955. We sincerely hope that for some years to come, he may continue to further develop his magnificent benefactions. -LUTHER K. YODER, Secretary, 69 Pleasant Street, Ayer, Mass.

1896

The academic year's services by your secretaries end with these notes. We wish to commend those who have contributed material to this end and remind those who have been silent that they make resolutions that will bring us material of Class interest during the coming year. It is very evident that most of us have been forced to realize our limitations and your secretaries have both had rough-going during the past year. We think we are improving and can carry on for another year, but respectfully suggest that we consider it wise to plan for the immediate future a replacement, in the event of our being incapacitated. We suggest Jimmie Driscoll and Henry Hedge as worthy successors to our job. Will you be kind enough to consider this situation and submit your ideas along these lines for a modus operandi? We are not as moribund as the above might indicate; however, it is fitting that we take a graphic view of the future and submit this suggestion for your prompt consideration.

We have received notice of a change of address for Victor Shaw to P.O. Box 116, Frazier Park, Calif. He says, "I like this park, a pretty place at the base of Frazier Mountain, an 8,000 foot peak

about 4,000 feet above this park. I plan this to be my next to the last move." Also, Ralph C. Henry has moved from Laconia to Guilford, N.H. We have also been notified of the death of a Classmate, Dr. Leon W. Mansur, P.O. Box 777, Pauma Valley,

Calif., on March 3, 1956. It is not surprising to any member of the Class of '96 that Paul Litchfield so gracefully retired from public relations with the Goodyear Tire and Rubber Company. The company paper, The Wingfoot Clan, of April 4, 1956, gives a full and interesting account of this. We regret that we cannot quote the entire article for you in these notes. The following is just a small part: "History Was Made in Goodyear Hall by Dramatic Announcement Tuesday (April 3). Packed with more than 1,700 key Goodyear employes Tues-day morning, Goodyear Theater was a scene of drama and history as sweeping changes in top-level management were announced. As the curtain went up, the audience was buzzing with anticipation. A. E. Firestone, Goodyear Secretary, opened the meeting with an official tone and introduced Chairman Litchfield, who was seated at a microphone at the left of the stage. He was given a rousing cheer by the standing audience. Speaking in a clear, strong voice, the dean of the rubber industry reviewed his long, fruitful and useful life with the company, starting in 1900 when there were only 176 on the payroll. Of those, he said with a note of nostalgia and sorrow, he is the only one still active. Looking over the crowd as he traced his career with Goodyear and, particularly the past 30 years in which he served as chief executive officer, there were noted many veteran employes, flanked by some of the younger officers. It was an unusual epic in industrial history as the veteran Mr. Litchfield revealed that, until a few years ago when an attack of arthritis, complicated by a serious automobile accident, he had looked forward to continued success and growth of Goodyear, with him in an active role. In the past three years, he said, he had given more and more thought to turning the reins of active management over to the men he had selected and trained. He then introduced the new Chief Executive Officer - E. I. 'Eddie' Thomas. Eddie had come into Goodyear as a stenographer and at the age of 18, became Mr. Litchfield's secretary. In the intervening years, the veteran tutor and the comparatively younger protege have enjoyed a close relationship given to few men, especially in industry. Mr. Thomas emphasized this relationship in one of the warmest tributes it is possible for one man to give to another." Your secretary has sent the following letter to Paul: "Dear Paul: I learned through the company paper of your relinquishing control of your association with the Goodyear Company. It is seldom that one's efforts are appreciated during one's active years. Every one of the Class of '96 has followed your career with pride, and what a thrill it must have been for one who began with the rubber industry and directed its progress to find one's self at the top. May your acknowledged infirmities deal with you kindly and may you accept the plaudits

of your accomplishments from your Class-

mates. Devotedly, John."

Our Class balances in the bank are: Class fund, \$234.11. Benevolent fund, \$1,383.27. - JOHN A. ROCKWELL, Secretary, 24 Garden Street, Cambridge 38, Mass. Frederick W. Damon, Assistant Secretary, Commander Hotel, Cambridge 38, Mass.

1897

We are glad to continue with further responses to our circular postal card sent to members of the Class early in March. The following from our old friend, Edgar M. Hawkins, 14 Stoddard Road, Hingham, Mass., under date of March 29, tells of his early business experiences. We will hope for a continuance later on of his subsequent life in Rochester. "How did your starting salary compare with today's? Placement Office, confirming this view, says that demand for engineers and scientists still on increase, but recruiting officers are stressing quality more and more. Personality and academic record major factors. At the same time students are taking a more mature approach to job hunting, fewer queries about pension plans and swimming pools, more about company and individual prospects. Starting salaries (SB), average \$400 a month. (Fifty years ago average starting salary, \$623 a year). This, plus a letter in the same mail reminding me that you wished something from me, prompts the following. 'Pop' Burrison stopped at our table during lunch the day before graduation. After a bit of his usual "kidding," with a hand on my shoulder he said, 'Day after tomorrow I am taking the Steamer Longfellow to Provincetown where I am going to build a cottage. Lumber has been delivered. A carpenter is laying it out. All I lack is a graduate mechanical engineer who has a pencil, a square, a saw, can saw to a straight line, a hammer and can drive a nail. If you can meet the specifications, Hawkins, join me at the pier.' I was there. Of all the many kindly and helpful boosts that have been given me throughout a long life, I count this as one of the greatest. Without it I would have been at work behind the local soda fountain. This was the only job I had found. With the cottage under roof, come August 1, I started at the Pennsylvania Steel Company in Steelton, Pa., running a 16-inch lathe in the machine shop. The pay was 16% cents per hour for a 10 hour day and a 60 hour week, no extra rate for overtime, Sundays or holidays. (As the best toolmaker in the shop was paid 22% cents per hour I was overpaid.) At noon of that first day 'O.T.' came over to my lathe, where I was eating my lunch, carrying a large pair of shears. 'They tell me you are a Boston lad, I am from Vermont. I don't want to see a New Englander hurt. I have already unwound three others from the back gears of your lathe. I am going to cut your sleeves off right at the shoulder.' On Friday of my second week, 'Milt,' the master mechanic, said 'We have a lot of work to do at night after six and when the mills shut down for Sunday. You have no family so I want you out when we quit Saturday at six. This became regular. I welcomed the chance to get in up to eighty hours a week. With board at four dollars a week,

washing and mending 50 cents a week and room seven dollars a month, this gave me a bit of surplus with no time in which to squander it. At Christmas Milt said, 'We'll be as near a shut down for thirty hours as we ever will be and we want you to run a test on the hydraulic line (750 pounds pressure). Shut off one mill at a time, take a reading at the pumps, and find out where our big leaks are.' At six on Christmas Eve, rats bigger than cats came up the sewers from the river by hundreds. We patrolled the plant together. The company was just working out of a receivership. Because of the receivership the entire staff of exceedingly able engineers, who, under Major Bent, had modernized the plant at Steelton and designed and built the new plant at Sparrows Point, Md., were all out. In August '97 the mills and shops were all under men, developed by Major Bent, of exceptional 'knowhow' and ability. Three M.I.T. graduates and one Lehigh man were leaders among the metallurgists. They controlled all the processes. The mechanical staff, however, consisted of just one designer and two detailers. I came next, for the salary range precluded bringing in a man of experience. After long idleness the Billet Mill was started. Repair work was scheduled for every week end. The engine driving the rolls was thoroughly overhauled. Parts were renewed by sketching them one week end, making new ones which replaced the old at the first opportunity. When finished, the engine still did not have power enough to drive the rolls when under the control of the governor. The engineer still had to watch the bloom come out of the furnace, judge its length and temperature, then at the right time put his weight on the governor, force it down and thus speed up the engine so that the heavy fly-wheel would help carry the piece through the eight or ten passes of the rolls. Because the fly-wheel had never burst, the assumption was that speed could not do it. Having in mind our laboratory tests with an indicator, I asked if we had one and if I could use it. One was found. The cards showed very late timing of all the valves. This was corrected. Monday morning the engine pulled all loads under governor control. This was very good fortune for it headed me into a study of the whole power situation in the plant. One development was a trip to Europe with the General Superintendent. He was a Course III man who had made several trips abroad. He was well known and an authority on Bessemer and Open Hearth practice. I tagged along to study the use of raw blast furnace gas in gas engines. When the depression of the latter part of '07 shut down the mills and banked the blast furnaces, I was very generously given a three month leave of absence. A most opportune call on Wilfred Bancroft resulted in my going to Rochester, N.Y. Here was nothing that constituted a steel town, but everything that such a town lacked. Rochester became our home until my retirement 41 years later."

The name of George Starbuck, 141 Weston Street, Waltham, Mass., seems familiar, but you will note from the following written by his nurse that he personally was unable to write: "He has been an invalid for two years. Confined to his bed most of the time. He is 83 years old, can read only with a magnifying glass. Does not remember what he has read, five minutes after reading. Sorry he cannot help you with any news although he still talks M.I.T. He must have been a great scholar. His only interests have been en-

gines and railroads."

Alfred Mansfield Brooks, The Brick House, Middle Street, Gloucester, Mass., writes under date of March 14: "Thing of such small value that I can afford in these days of high prices to give it to you! What I have always liked, I like better and better as my years approach an astronomic figure. Gardening, 'victuals and drink,' books - Dante and the Eighteenth Century novelists which does not mean I cut out the Twentieth, drawing and engraving, music and architecture, and the concerns of our flourishing historical society and museum. In fine a quiet life, and a very pleasant one. When I say that I mostly stay at home, which I do, truth compels adding that my wife and I are not long back from flying to California, and a visit in Chicago which I think our most impressive city and, in many respects, the most beautiful.'

Carl W. Sharer, 6627 Wayne Avenue, Philadelphia 19, Pa., writes: "I am very sorry that I cannot give you any interesting news about the Class as I have not been in touch with any of the members for more than thirty years. In 1946, following doctors orders, I joined the leisure class. Now, by limiting my activities to about the same amount I used to do in one hour or so I manage to keep feeling fit, and have little or nothing to worry

about."

Research is the order of the day, particularly amongst the engineering profession and Ned Olin, who was interested in determining the names of those members of the Class that graduated before their 21st birthday. Up to the present he has discovered three. The youngest to date was Irenee duPont who was born in December 1876; the next was yours truly born in October, '76, and Ned Olin himself was born in August of that year. If there are any more candidates who would like to submit their vital statistics, send them either to Ned Olin at 98 Park Street, Braintree 84, Mass., or to the undersigned.

A new member of the Class has turned up even at this late date. We have been informed by the office of the Alumni Register that while we had no address previously, Lincoln Crocker, Course XIII, now lives at 23 Middle Street, South Dartmouth, Mass. Welcome to the ranks.

From the Quincy Patriot Ledger of March 14, 1956, we learn that William Binley of Exeter, N.H., formerly of Braintree and Wollaston, last week visited the Fore River Yard where for many years he was production naval architect prior to retirement several years ago. He attended a demonstration of photography applied to hull steel fabrication. In the evening, he was a guest at M.I.T. of which he is a graduate. He was accompanied by his son, Bruce Binley, assistant superintendent of ship cost estimating at Fore River. Mr. Binley returned a few days ago from an automobile trip of two months with Mrs. Binley to Mexico.

The Hartford Times, under date of April 5, 1956, contains the following: "Charles L. W. Pettee of 155 Girard Ave., will be one of 38 chemists and chemical engineers to be honored as 50-year members of the American Chemical Society at the society's 129th annual meeting in Dallas, Texas, Monday, Mr. Pettee graduated with an S.B. degree from the . . . Institute . . . in 1897 and worked for the Pope Manufacturing Company here until 1903. He then opened his own testing laboratories which he operated until his retirement in 1950."

This will be the last copy of The Review until next fall. However, it would be well for those members of the Class who are interested to be thinking over what plans should be made for the celebration of our 60th anniversary in June, 1957. Suggestions would be appreciated. — John P. ILSLEY, Secretary Pro-tem, 26 Columbine Road, Milton 87, Mass.

1899

Bassett Jones, VI, now living in New York City, calls that metropolis "organized discomfort," a designation which many of us will agree as very apt. On leaving the Institute he was engaged in open-hearth furnace work for about five years. He then became supervising engineer for Douglas Robinson, Charles Brown and Company. In 1909 he joined up with Henry C. Meyer, Jr., later to become a member of Meyer, Strong and Jones, consulting engineers. He retired in 1935. Some of Bassett's activities and interests are: member and past chairman, executive committee of sectional committee American Standards Association safety code for elevators; served from 1921 to date, representing American Society of Mechanical Engineers. Now as "member at large." Past chairman subcommittee on research of above A.S.A. committee. Chairman sub-committee on elevator rules, of building code committee, Merchants Association of New York. During World War I, with Emergency Fleet Corporation. Inspector of Yards; also consultant to Bureau of Yards and Docks on Fleet Operating Base, Fleet Supply Base, Pelham Camp. During World War II, consultant to division research statistics, War Production Board, for one year consultant on illumination, board of design, New York World's Fair, 1939. Chairman committee of displays, member of color committee; consultant to Miss Maude Adams on stage lighting, 1912-1920; consultant on switch gear and factory power distribution for General Electric Company 1920-1930. Wrote many papers on power distribution; on elevator design and service requirements; and on illumination. Published in transactions American Institute Electrical Engineers; Illuminating Engineering Society; and in General Electric Review; Electrical World; American Architect, etc. Wrote Mobil Color and Stage Lighting; published Electrical World, July 1931. Published a paper for the Society of Professional Electrical Engineers: "Benefit of Velocity to the Engineering Student." On Nantucket Island, developed and introduced the Black Japanese Pine, as a

standard evergreen for coastal planting. Wrote "Pinus Thunbergi," National Horticultural Magazine, October 1930; "Was Nantucket Ever Forested?", Proceedings Nantucket Historical Society, July 1935. Was one of the original group that developed quick freezing with Clarence Birdseye. First president General Seafoods Corporation. Author of Debt and Production (1934), Horses and Apples, (1935), "Arithmetic Monsters and Economic Absurdities" in the Journal of Accountancy, March 1942. Bassett has been working on the manuscript of a book Numbers Called Money, a study of the evolution of the money device and the evolution of the numbers device. A typewritten copy of the preface is in my possession. Maybe at a later date I may have the courage to comment on this.

Carroll Brown's son, Arthur, has been in California doing research work for the Pratt and Whitney Division of the United Aircraft Corporation. So, just before Christmas, Carroll and his wife took a plane trip to the West Coast for a visit. An 80 m.p.h. wind forced them to land at Salt Lake City for extra fuel. They arrived late in San Francisco in the heaviest rain storm in that area for the last 50 years. Arthur, driving to the airport, took a road that shortly thereafter was closed by wash-outs and landslides. Carroll is still busy in school construction work.

Through the courtesy of Ralph Hayden '04 who lives at Los Altos, Calif., more details regarding the death of Wallace McCrea are now available. Wallace died on April 5, 1954, after an illness of a few weeks. Three sons survive him. After he retired seven years ago, he went into private practice in New York City, specializing in the field of homes. His most outstanding design was the country home of Bruce Barton, well-known columnist and advertising man. Wallace served as captain in the Army Corps of Engineers in World War I, spending two years in France.

Herbert Dakin, V, states he is leaving Florida to live with relatives in Maine. That's a rugged change of climate.

While most members of our Class are on the retired list, Charles Page, XIII, reports he is busy most of each week. His address is Page Associates, 800 West North Avenue, Chicago, Ill.

Those who attended the 50th Reunion Class luncheon will remember Edna Chandler Thompson. Edna was the only Course V co-ed and a very much respected member thereof. After she received her degree from M.I.T., she taught mathematics, chemistry, and history at the high school of her home town, Brunswick, Me. After her marriage to Dr. Thompson, she went to live in Bangor, Me., where she now resides. A brother-in-law and two nephews have since graduated from the Institute. Her three children graduated from Wheaton, the University of Maine and Boston University, respectively. Two granddaughters are attending Madison College, Virginia, and Oberlin, Ohio. The Thompsons have nine grandchildren.

A postal from Commodore Jim Ellery indicated that his interest in Henry George's single tax theory is as active as ever. Well, wouldn't we all like to get only a single tax?

Lawrence Addicks claims a Class record for living happily with the same girl he married ten days after graduation. Any contestants? His address is Bel Air, Md. — B. R. RICKARDS, Secretary, 173 Edgewood Avenue, Pleasantville, N.Y. MILES S. RICHMOND, Assistant Secretary, Little Compton, R.I.

• 1900 •

When you read these notes our annual Reunion will be long past, although it is now four weeks away and we are only just receiving replies to the letter announcing the Reunion. The personal information contained in these replies will be relayed to you in installments, beginning with the following. Paul Leon Price, who has attended many of our reunions but says that he cannot come this year, writes: "I have passed the 'four score' point and I am still on the job commuting to New York five days a week. Since Jan. 1, 1956, I have made a three weeks' business trip Southwest as far as El Paso and a two weeks trip Southeast as far as Miami, Retirement date is not even being discussed as yet. My son, Harold, is in the tent and awning business in Danville, Ill. and lives in Covington, Ind. He has five children, the two older ones married and have given us three great-grandchildren. My daughter, Elinor, still lives in Cooperstown; her 'hubby' an auto mechanic in the Chrysler Agency. Their oldest child, David, is married and has two greatgrandchildren for us. Total: seven grand and five great-grand! Sorry we can't be with you.'

Mrs. Ingersoll Bowditch writes, "It is very pleasant to be still included in Class affairs and I wish I might be at Cotuit with you in June, but I have a grandson's wedding in California to plan for and am very uncertain as to just where I shall be on the 12th. You ask for 'news' - our oldest boy, Samuel, is a geologist living in Salt Lake City. His son, James, is at the Stanford University, after two years in the army in Japan. He is marrying a Stanford classmate and plans to go into teaching. Sam's daughter, Faith, is a Sophomore at Smith. Our younger boy, Charles, is married but has no children. He is connected with the Sunray Company of Tulsa, Okla. Sylvia, Jr. is married to Samuel Newson, a landscape architect, has a daughter and son and lives in Mill Valley, Calif. I am kept busy commuting across the country."

Warren Edson says, "Nothing of particular interest to write about. Have been a widower for nearly twelve years and am living in St. Petersburg, Florida. I retired Jan. 31, 1948 after working for the Commonwealth of Mass. for about 37 years. My regards to any classmates who knew me long ago and still remember

me."

Mrs. George Russell writes, "I appreciate very much your thinking of me at this time. I would certainly join with the Class on June 12 at the lovely Pines, but I am leaving for Europe for the summer on July 6 and need the time and the money in preparation for it. I shall be around next year and would love to go to Cotuit again. I have been busy and still live at Audubon Road (Lexington, Mass.)."

Charlie Newhall, who is coming to the Reunion, says, "My last operation, which I completed about a year ago and am having the fun of operating at the present time, was the 1200 Beacon Street Hotel. The Hotel contains 170 rooms with dining facilities for 200 people and a garage beneath for 200 cars. The last few months it has been 100 per cent occupied and bids fair to continue that way. It has reached the point where the guests habitually make reservations in advance.' Any of you who come to Boston and need hotel accommodations, particularly if you come by automobile, would do well to communicate with Charlie. The Hotel is located on Beacon Street just on the intown side of Coolidge Corner.

We have heard from the daughter of Charles Comey that her father is in the Metropolitan State Hospital as he is afflicted with hardening of the arteries. Mrs. Maurice Davenport replied that Maurice died on April 1. We were also advised that Miss Jean McIver, a Wellesley graduate who was with us for a while

died in January, last.

We have just received word of the death, on May 10 of Charles E. Baldwin. He graduated from Harvard in 1899 and from M.I.T., Course V, with us. He was a pioneer in the development of rayon, being associated with Arthur D. Little. For a number of years he managed two of the largest rayon plants. Since his retirement, he has lived in Canaan, N.H. He leaves a widow and three sons; Oliver Hazard Perry Baldwin, President of Farmers Bank of Delaware, Charles E. Bald-win, Jr., Treasurer of New York Life Insurance Company, and Lawrence P. Baldwin of San Antonio, Texas and six grandchildren. - ELBERT G. ALLEN, Secretary, 11 Richfield Road, West Newton, Mass.

· 1901 ·

These will be the last Class Notes until next fall. The Reunion is over and I will send you all a report of the affair in the near future if it has not already gone out. This issue will include more of the Class Letter replies.

Ed Church, XIII, II, from Elmira, N.Y., writes: "As I (and probably many others) have said many times before, my 'commonplace every day doings' would be of vanishing interest to anyone. I am still working at the job of being retired, looking after my immediate family and several more distant relatives. Owing to the poor health of some of these, I do not get around as far and as often as I used to do. There seem to be no classmates in this vicinity. I have read over the plans for the 55th Reunion with interest. It is possible that I will get to it, but he chances are hardly 40 per cent. I am, however, returning Dow's questionnaire with some indications of preferences if I should attend. I am sorry that I have no attention-arresting events to chronicle, like the acquisition of a uranium mine, the writing of another book, or the growing of a second crop of hair. Just plain Ed.'

From Westwood, Mass., Anthony Peters reports: "Nothing new, Just bumming around Westwood. Spend considerable time watching the contractor building our new \$150,000 Parish Hall. You don't get

much for your money these days. When you compare Western Fir with good old New England 'Punkin' Pine — that's long gone." E. H. Pendleton, III, South Orange, N.J.: "About ready to publish my third book on the Pendletons. — 'Early New England Pendletons.' My third great-grandchild was born last December."

Stanley Sears, III, in Washington, D.C. says: "Up to the time of my retirement (compulsory at the age of 70) from the Valuation Division, Income Tax Unit, Mining Section, Internal Revenue, nine years ago, I have not done a blooming thing that would be of interest to you. Occasional parties and golf three or four days a week at the Army-Navy Country Club would seem to sum up the matter. More recently, since giving up golf, reading and walking are about all that are left. With this short and simple annal and hoping you are the same, I am sincerely yours."

George Allen, who lives in East Bridgewater, Mass., tells us: "After two heart attacks and losing my wife two years ago, my activities are somewhat limited and I doubt if I can attend the Class Reunion this year. After 40 years with the B. F. Sturtevant Company as manager of the Gas Equipment and Compressor Departments and a few months with the Westinghouse Electric Corporation after they took over the Sturtevant Company, I retired at the end of 1945. My wife and I were both interested in antiques and we had a lot of fun collecting them for ourselves and some of our friends as long as our health permitted." Joseph Gund, I, Freeport, Ill. reports: "Have been in the municipal and highway paving business since 1909. Am 78 and still active in the business.

From Mrs. Peterson comes the following. "On April 11, Charles Bittinger went to Cambridge and unveiled the model of the moon on which he had been working for eight months. It is now at the Harvard Observatory." — Theodore H. Taft, Secretary, Box 124, Jaffrey, N.H. WILLARD W. Dow, Assistant Secretary, 78 Elm Street, Cohasset, Mass.

· 1902 ·

Haanel, Course XII, writes as follows: "I was indeed pleased to receive a personal letter from the president of my Class, '02. It is 54 years now since I left Boston and M.I.T. and sadly enough, most, if not all of my friends are now in their graves. Since I was born Sept. 2, 1877 no one could stretch their imagination or distort the truth enough to call me young — but I am hale and hearty despite the fact that I had an operation two years

"When I left M.I.T., I obtained a position with the American Bridge Company, N.Y., and later served some time with a contracting firm of the same city. In 1905 I returned to Canada, where I was born and received my primary education, and entered the government service as an engineer in the Department of Mines and Resources at Ottawa. I organized the fuel research laboratories of the mines branch of the Department of Mines and resources and served as its head until I retired from service some nine years ago.

"During my tenure of office as chief of the fuel research laboratories I wrote several reports which I presume you will find in some of the libraries of your country. In 1908 I accompanied the chairman of a commission to witness and report on tests which were conducted in Sweden on the smelting of iron ores in an electric shaft furnace. I was also partly in charge of the work, carried out at Sault Sainte Marie, Ont., on the smelting of Canadian refractory iron ores in an electric furnace. This work was in addition to my regular work on fuels. In 1912 I was appointed by the federal government to proceed to England and Europe and report on the status of the low temperature carbonization processes in those countries and also investigate and report on the various processes then being employed for manufacturing peat for domestic use and for power purposes with especial reference to the recovery of ammonium sulphate as a by-product. I prepared a fairly large and comprehensive report on the investigation.

"In 1924 and 1928 I was appointed the Dominion Government official delegate to the World Power Conference which met in London, England, and Berlin, Germany, on three dates. At these conferences I presented papers. At the 1928 conferences held in London, I represented the British Dominion i.e. Canada, Australia, etc., at the opening session.

"Two years ago Dalhousie University, Halifax, N.S., honored me by granting me an LL.D.

"Since my retirement I have not been seriously engaged in any particular business. I enjoy playing golf and English billiards and am a member of the Rideau Club, Ottawa, and the Royal Ottawa Golf Club. I was for years a member of the Royal Canadian Yacht Club, Toronto. Just for the record, I might tell you that I am a life member of the Engineering Institute of Canada (M.E.I.C.) and received the Gzowski medal for a paper on fuels I presented before that body at one of their Annual Meetings, 1921, I believe. I am also a member of the American Institute of Chemical Engineers - and other organizations.

"While chief of the fuel research laboratories I and my colleagues were closely associated with the chief and staff of the U. S. Bureau of Mines, Washington and Pittsburgh. At this time I don't believe I have anything more of interest either to you or any of the '02 Class now living. Al Higgins, now dead, was one of my dear friends and he paid me a most delightful visit a few years before he died.

"I used to live while in Boston at the K₂S boarding house. Practically all of the men boarding at the house situated on Pembroke St. were chemical engineers or intended to be such. I believe most of these men are gone. - P.S. I should have mentioned that two or three weeks ago the Right Honorable C. D. Howe, Minister of Trade and Commerce and the Hon. Mr. Winters, Minister of Public Works Works gave a luncheon at the Rideau Club to meet M.I.T.'s able President, Dr. Killian. I was also a member of the dominion fuel board and a member of the dominion power fuel board while it was still active.

Eastwood writes that there is little news

but that he recently celebrated his birthday and that about 40 members of the faculty in mechanical and aeronautical engineering of the university (Washington) and some ten secretaries gathered to help him enjoy the occasion. Grant Taylor writes from Clearwater, Fla.: "I am sure that all members of XIII will be glad to hear from you (Dan) as I was. May you have a comprehensive reply from each one. There are no stirring events to be reported from here. I believe I wrote you that we spent two weeks in October at Lake Lure, in the Asheville region. Since then we have traveled no greater distance than to near-by Tampa. We make a number of new contacts here and renew previous ones, all very agreeable. John Buck has been at Grey Gull Inn again and we occasionally see him at his shuffle-board play. Right now one of the former associates at the Turner Construction Company Boston office is spending sometime at Clearwater Beach. I am wondering how you made out going to Friendship as early as March 17 with all the heavy storms in the North. However, the northern areas have no monopoly on unseasonable weather; our outside temperature this morning (March 21) was 40 degrees. Possibly the citrus people inland were not prepared for anything like that as it is generally quite a bit colder in interior regions.

Harold A. Everett is professor emeritus, mechanical engineering at Pennsylvania State College and still a very busy man as his letter to Dan shows clearly. He writes: "Yours of the 14th was very welcome and will send quick reply. Think 55th would be better away from city. As for personal notes: retired in '46 and for next several years worked as consultant for the Texas Company on development of their new internal combustion engine, doing mostly thermodynamic analyses of combustion as affected by variations in rate of fuel injection, swirl, timing, and so on. The last year have done little professional work. We still have a place in the Thousand Islands on the St. Lawrence where we spend most of the summer and are pleased to have the children and grandchildren enjoy it as much as we always have. Nine grandchildren now, four boys and five girls. The two oldest boys are now both in the Marine Corps, U.S.N., one on the new big air-craft carrier 'Forrestal.'

"At home keep quite busy on general maintenance and gem cutting and lapidary work, a fascinating field dealing with beautiful stones. Both Mrs. Everett and I are well, active, and very happy. What more could we ask?"

A letter from Mrs. Nathaniel Sprague gives news of the death of her husband, Nathaniel Sprague, Course VI, on March 28, 1956 in Schenectady, N.Y., where he had been connected for many years with the General Electric. Sprague was a native of Gloucester, Mass. After leaving high school he trained at the Rockport Granite Company as machinist before entering the Institute. Upon graduating, he took a position with the Consolidated Car Heating Company in Albany, N.Y., and a year later joined the G-E in Schenectady and later became engineer in the railway department there.

He was retired in 1938 but was re-

called in 1941 by the government as naval inspector at G-E. He was active in civic affairs being at one time member of the Schenectady County Welfare Board, a former director of Hotel Van Curler, a member of the County Draft Board, and a past president of the Taxpayers' Association. He also held membership in the Mohawk Club, the G-E Quarter Century Club, St. Stephen's Episcopal Church and was a Royal Arch Mason.

He is survived by his wife, Mrs. Cassie North Sprague, a daughter Mrs. Edwin B. Judd and four grandchildren.

The members of Course II have responded well to Greeley's plea for personal news as will be seen below. William D. Crowell of St. Louis relates: "Once back in the fall of 1912 I was touring through the East with my old architect friend, Benno Janssen (you know he used to be with Parker and Thomas at the time I was there), and at Newport we ran into my old friend, Chester Nimitz, who was then the lieutenant commander in charge of eight or nine submarines; and after entertaining us delightfully on the mother ship, one day, took us for an underwater cruise all the next, and I had the experience of steering her down ninety feet below the surface; I couldn't go lower because we were scraping on the quohogs.

"I am not doing any architecture now as I retired from business when I got sick about five years ago, but after a wonderful operation I got well, after having been pronounced dead twice, my wife even buying a cemetery lot and ordering a coffin. Then a miracle happened and I am now better than I had been for ten years. I confine myself to eating the frosting off the cake of life and I expect to do this very thing for another 15 years.

"My hobbies, consisting of oil painting, both portraits and landscape, and flute playing, to which I easily devote two hours a day at practice and play in two orchestras which meet at my house, are what keep me young. I have been quite successful with my mechanical inventions and if Henry Ford hadn't favored me by using one I wouldn't be so free to travel. We take a few trips a year in the car; and by the way I was thinking of getting a sports car. Last winter we went to Florida, in the spring to Maryland, Cape Cod last summer and to Taos, Mexico in the fall. In a couple of weeks we are going abroad for a tour and this summer we will go to New England again, stopping off at Boston, and there I hope to see you, my dear Roger. I hope you are wearing knickers when we meet for I never saw you in anything else and doubt if I would know you in long pants.'

Saylor writes that he is still at his old job editing the Journal of the American Institute of Architects but has no news to contribute. E. B. MacNaughton offers the following personal notes as to his career: "I have lived in Portland, Ore. for 54 busy and pleasant years. I was a Course IV, Option 2 graduate. Arriving in Portland, I started work in building design and construction, which led into real estate promotion and management. That, in turn, led to the organization of a trust company. In 1928 I acquired an interest in the First National Bank of

Portland, and in 1931 I became its president. The bank then had approximately \$35 million in resources. In 1947 I eased off into the chairmanship of its board and still serve in that capacity. Today the bank is the largest in the Pacific Northwest with around \$900 million in resources and 70 branches in Oregon.

"Throughout the years I have lived in Portland, I have been active also in newspaper, merchandising, insurance and manufacturing lines, and have taken a keen interest in the affairs of Reed College where for many years I was trustee and president of its board. From 1948 until 1952 I was president of the college. I have three children, two sons in Hawaii and a daughter who resides in Portland, and 14 lively grandchildren. I have enough ancilary interests to keep me out of mischief and still time to enjoy my friends and do considerable reading and study, especially in the fields of biography and history, with a yen for weekend painting." Roger adds MacNaughton is also national president of the American Civil Liberties Union and has recently been moderator of the American Unitarian Association. - Burton G. Phil-BRICK, Secretary, 18 Ocean Avenue, Salem,

• 1904 •

Last month's notes were due in The Review office on Friday, the 13th day of April and when I turned them in it was with some light remark that contrary to the usual idea, there didn't seem to be much along the line of there being ill luck coming on that date. I was a bit too premature, for while I was turning in the notes, our Classmate, Dwight Fellows in Bonita Springs, Fla., where he was about to finish his winter vacation, was suffering a sudden and fatal heart attack. As far as I know he had not been subject to such attacks but had suffered from arthritis, which had caused him to go down South each winter as he found the warm climate to be beneficial to him.

The following clipping from the Sunday Globe of April 15, 1956, gives a good account of our Classmate. "Otis D. Fellows, 74, prominent civil and mining engineer, died while vacationing at Bonita Springs, Fla., it was learned here today. A native of Boston, Mr. Fellows was educated at Newton High School, and graduated from M.I.T. He was active in the Michigan copper mining district for more than a quarter-century and later served as chief engineer of the Boston Metropolitan Planning Board and the Massachusetts Planning Board. Mr. Fellows played a prominent role in professional and civic circles. Among his numerous affiliations were memberships in the Boston Society of Civil Engineers, Masonic organizations and the Newton Center Improvement Association which he formerly served as president.

"He leaves two daughters, Mrs. Richard S. Williams of this city with whom he resided, and Miss Alice M. Fellows of Windsor, Conn.; also two sisters, Mrs. Frederic G. Melcher of Montclair, N.J., and Mrs. Alfred B. Hastings of Mansfield, Conn., and two grandchildren."

The following letter from Ralph Hayden gives us some more information: "I am wondering if by chance you had been notified of Dwight Fellows' death in Florida on April 13. I received a telegram from his daughters on the 14th. He apparently passed away suddenly of a heart attack. As you know, he had an illness last fall, but recovered quite fully, so that he drove to Florida alone and was quite enjoying himself in the warm climate. His daughter, Mrs. Richard Williams, lives in Newtonville at 17 Winchester Road.

"In the summer of 1904 he went to Houghton, Mich., where he worked for the Copper Range Mining Company as engineer for several years, then as superintendent of their Baltic Mill. I went to Michigan in 1917 as mill superintendent for a mining company, so for quite a few years we were only 18 miles apart, and we and our families had many gettogethers. He married a Houghton girl, Emma Penberthy, who, as you know, passed away several years ago. He has been going to Florida to escape the cold of New England."

Memorial services for Dwight were held at the Trinity Episcopal Church in Newton Center on Tuesday afternoon, April 17, and were attended by a number of Classmates.

The following clipping from the Boston Herald of May 15, 1956, relates the death from an exactly similar cause of Harry H. Groves. Harry had had a heart condition for some time but his end came very suddenly. His son, Quentin D. Groves, is a member of the Class of 1947, M.I.T. "Harry Hunt Groves, 75, of 634 Webster Street, Needham, retired engineer of the Interstate Commerce Commission, died suddenly yesterday.

"Born in Framingham, he was graduated from M.I.T. and served as a civil engineer with the Boston and Albany, Boston and Maine, and New Haven railroads. He leaves a wife, a son, and two grandchildren."

I have been notified by the Alumni Office of the death on April 9 of Harold W. Sherrill, of 3804 150th Street, Flushing, N.Y.

From a letter from Gilbert Gleason'05, we get some welcome information about our Classmate, John R. Marston. "I always thought John Marston was a Classmate of mine, but I see from the Alumni register that he is supposed to be in '04. He was for a long time with the Phelps-Dodge copper company down in Clarkdale, Ariz. A few years ago he retired and moved with his wife to St. Petersburg, Fla.

"They live there now at 5241 Third Avenue, South. John hasn't been too well, he has had much trouble with his eyes, and while he can get around alone, he doesn't drive any. He is somewhat better lately but probably won't ever have full use of his eyes. He was always so quiet and talked so little about himself, that I am assuming that you haven't heard from him for a long while, so thought that this news might be of interest.

"His wife, the former Marion Proctor of Marlboro, Mass., is a distant relative of mine and we expect to see them next winter down in St. Petersburg."

If any of you fellows remember the *Technique*, that handsome volume always formally published by the Junior Class in

its Junior year, Claude E. Patch'02, Morton C. Tuttle Company, 862 Park Square Building, Boston, has a complete file from 1904-1909 inclusive which he would like to see put to good use. So if you are interested, contact him.

Well, brothers, that's all for now and until November, I wish you a good and restful summer and vacation. — Henry Stevens, Secretary, 1082 Commonwealth Avenue, Boston, Mass.

· 1906 ·

As these notes are compiled in the middle of May, it is too early to include any account of our 50th Reunion and too late to make any final effort to stimulate attendance. The only alternative seems to be to use some of the information submitted by Classmates in their letters advising of their inability to attend.

George Burpee, Course II, had a meeting in Oakland, Calif., on June 8 as well as other meetings on the 7th, 9th and 11th and wrote he was "greatly disappointed that I will be obliged to pass up the 50th

Reunion."

Walter Davol, VI, had already scheduled a trip to Portland, Ore. to see his new granddaughter but sent his greetings and best wishes to Classmates. He also wrote, "Although in the latter part of 1953 I gave up active participation in business, I go, as before, to the office from which vantage point I keep busy working with social service agencies such as the Crippled Children's Society, Boy Scouts, and so on."

Alexander Hicks, II, returned his registration sheet with the following: "There is not much to say. Have lived a quiet, not too eventful life with some success, have enjoyed good health up to the last year when my boat blew up and put me in a hospital for three weeks. The hospital experience was such that this February I tried it again for three weeks for a major operation. Would be very glad to hear from any one who remembers me. P.S. I

have bought a new boat."

Harold C. Elliott, I, who lives in Wellesley, Mass., wrote: "Greetings and best wishes for a happy Reunion. Became disabled in May 1955, and was forced to retire after many years in manufacturing. Haven't forgotten some of you boys coming into lecture hall through the windows after Professor Arlo Bates had locked the doors; nor how Professor Faunce was roughed up in his descriptive geometry class. Eventually we became civilized."

Classmates will be sorry to hear that Bill Englis, III, who lives in Garden City, New York, had a heart attack early in April which kept him from attending.

Classmates will also be sorry to learn that Claude McGinnis, VIII, who, since retiring as a professor of physics at Temple University in Philadelphia and has resided in Clearwater, Fla., wrote that Mrs. McGinnis passed away early in April.

Clarence Lasher, VI, who lives in Everett, Wash., sent a clipping from the local paper congratulating him upon rounding out 50 years in public utility work. He has been manager of the Washington Natural Gas Conmany in Everett. He began his career as a meter inspector in Adams, Mass. in 1906. Four years later

he transferred to Milford, Mass. and in 1912 he went to Pawtucket, R.I. Six years after that he became superintendent of the gas department of the Puget Sound Power and Light Company in Bellingham. From Bellingham he transferred to Tacoma but in 1925 he came to Everett as manager of the gas company. He has been president of the Puget Sound Technology Club.

The Secretary received an interesting letter from Herbert Mann, IV, who is head of the Herbert J. Mann and Associates, Inc., Consulting Architects and Engineers in Pasadena, Calif. Mann has had a wide experience in architecture and building including four years as construction superintendent in Chicago, 13 years in Arizona, engaged in the construction of bridges, buildings and irrigation projects for private individuals, and for cities, counties and the U.S. government. In 1923 he moved his headquarters to Los Angeles. In World War II, Mann was associate engineer for the U.S. War Department. Since the war he has devoted all his time to organized research in the cost reduction of buildings. For eight vears he has conducted a weekly radio program on radio station KFI on the subject of cost reduction for residences. Also he is conducting lectures before organizations such as bar associations, school boards, churches and civic groups. His wife, Stella Terrill Mann is a noted lecturer and author and has appeared on her husband's radio program.

In addition to the above, the Secretary has some other letters which will be read at our Reunion and will be included in later issues of The Review, as it is felt that all Classmates will find them most

interesting reading.

The Secretary regrets to report that he has received notice of four deaths during the past month. They are as follows:

Howard W. Key, Course VI. Key went to the General Electric Company immediately after graduation and spent two years in Schenectady, a year in New Orleans and was in Atlanta, Ga., from 1914 to 1938 when his address was changed to Austin, Texas, where he resided at the time of his death, which occurred in January of this year. It is the Secretary's recollection that Key and L. S. Woodruff, also VI, were graduates of another college and spent two years at M.I.T. getting their degrees in electrical engineering.

H. K. Munroe, VI, passed away in Tacoma, Washington, May 28, 1955. Our card record indicates that in 1913 he was assistant superintendent of power with the Puget Sound Electric Railway and Tacoma Railway and Power Company. Since then most of his time had been spent in Tacoma and in 1948 he was listed as vice-president of the American Plumbing and Steam Supply Company in that city. Word of his death was received from his sister who advised that he had been looking forward to his Class Reunion but he passed away very suddenly as the result of a stroke.

Capt. G. C. Westervelt died in Stuart, Florida on March 15 of this year. Capt. Westervelt was one of the Annapolis men who came to M.I.T. for advance work in naval construction. He had a brilliant record in the Navy, heading all Naval air-

craft construction during World War I. He was head of the Naval aircraft factory in Philadelphia from 1919 to 1927 and had charge of constructing the giant dirigible, ZR-2 and a naval seaplane, the PN-9 which set a new world endurance record of 28½ hours in 1925. In 1942 he was called in by the Navy to operate the three plants of the Brewster Aeronautical Corporation, Long Island City, N.Y. After his retirement he served as chairman of the board of Kentucky River Coal Corporation and maintained a winter home at Jupiter Island near Hobe Sound, Fla. and owned a 30,000-acre ranching development near there.

Malcolm G. Wight, Course I and VI, passed away in Venice, Fla., on April 30. Wight's professional career was entirely in the insurance business. He was in Boston through 1926 when he was transferred to the home office of the Hartford Fire Insurance Company at Hartford, Conn., where he remained until he retired in 1954 when he moved to Canaan, N.H. While in Boston, Malcolm always demonstrated his interest in Technology and the Class and was one who could always be counted upon to support Institute affairs. He had a very successful career in the insurance business and at the time of his retirement was the secretary of the Hartford Fire Insurance Company. He is survived by his wife, a daughter, Mrs. Carleton S. Redmond, Jr., of Laconia, N.H., Willard M. Wight of Cransford, N.J., and Mrs. Leland Emke of Mt. Pleasant, Iowa. The Secretary and Mrs. Kidder attended the funeral service for Malcolm in Hartford on Monday morning, May 7, at 10:30. After the service we ran into Walter Davol, who had come down from Manchester, N.H. to attend. Walter was an agent for Malcolm's company in Manchester, N.H. - JAMES W. KIDDER, Secretary, 215 Crosby Street, Arlington 74, Mass. Edward B. Rowe, Assistant Secretary, 11 Cushing Road, Wellesley Hills 82, Mass.

· 1907 ·

Early in April Don Severance, Secretary-Treasurer of the Alumni Association, telephoned to me to ask me to be chairman of a committee to prepare resolutions on the death of Alexander Macomber. I was glad to accept this assignment, and at my suggestion Phil Walker, our Class Treasurer, George Crane, the '07 representative on the Alumni Council, and Gardner ("Tom") Gould, who was a high school Classmate of Mac, as well as an '07 Classmate, were appointed members of the committee. The following resolutions were prepared and read by Tom Gould at the Alumni Council meeting on April 30, and they were unanimously adopted. The original copy was sent to Mrs. Alexander (Frieda Terry) Macomber, and a copy is bound into the perpetual minutes of record of the Alumni Association, another copy is in the records of our Class, and copies have been sent to all members of the Alumni Council. The resolutions are as follows:-

ALEXANDER MACOMBER, 1885-1956
"In view of the death, on March 14, 1956, of Alexander Macomber, M.I.T. Class of 1907, and of his many activities directly connected with the Massachu-

setts Institute of Technology, we deem it fitting to take official note of his passing, and to make official recognition of some of his publicly rendered services to his Alma Mater.

"1. He led the academic procession at the inauguration of Dr. Karl T. Compton as president of M.I.T. in June of 1930, and for 18 consecutive years, 1931 through 1948, he led similar processions, as marshal at Commencements; all with characteristic dignity and grace.

"2. In 1917-1918, and again, 1920-1922, he was a member of the Executive Committee of the M.I.T. Alumni Association; and during the year 1928-1929

served as its 35th president.

"3. During 1925-1927 he was a club representative on the M.I.T. Alumni Council; during 1923-1925 a member of the New York Technology Club Committee; also during 1923-1925 a member of the committee to nominate representatives of local associations; and in 1927-1928 a member of the committee to aid in the celebration of Open House at Tech.

"4. From 1929 to 1934 he was a term member of the Corporation of M.I.T., drawing on his knowledge of the Institute, of engineering, and of sound business to help formulate the policies of the Institute

during that period.

"5. He was secretary of the class of 1907 during his senior year as an undergraduate, and continued as graduate secretary until 1908 when he relinquished that office due to his being located as an engineer in the mountains of western United States and hence unable to perform the secretary's duties. He was president of the class from 1943 until the time of his death.

"At the meeting of the M.I.T. Alumni

"At the meeting of the M.I.T. Alumni Council held on April 30, 1956, the following resolution was unanimously

adopted: -

RESOLVED: First, that in the death of Alexander Macomber the Massachusetts Institute of Technology and the class of 1907 have lost a loyal, efficient, and distinguished alumnus, whose sterling character as a true gentleman, and noteworthy ability and charm, as manifested in his relationships with his business and engineering associates, his college (as recited above), his fraternity - Alpha Tau Omega, of which he was national treasurer for 35 years, his church - Old South Congregational of Boston, of which he was a member and trustee, his many friends in all walks of life, and his family, will ever be an example and inspiration to all who knew him.

"Secondly, that the original copy of these resolutions be given to his widow,

Mrs. Frieda Terry Macomber.

"And finally, that copies be incorporated in the records of the Alumni Council of Massachusetts Institute of Technology and of the class of 1907.

"Committee on Resolutions on Alexander Macomber, as appointed by Donald P. Severance, Secretary-Treasurer of the Alumni Association of the Massachusetts Institute of Technology. Signed by—George A. Crane, Gardner S. Gould, Philip B. Walker, and Bryant Nichols, Chairman."

The May 5, 1956, issue of Business Week contains a picture of Clarence

Howe, Minister of Trade and Commerce for Canada, and quotes remarks made by him in connection with a discussion regarding the large number of Canadian industries that are controlled by United States money. - In the April 12, 1956, issue of America's Textile Reporter, a a leading textile trade paper, it is stated that our Classmate, Fred Moses, had been elected a director of Textron American, Inc. Fred is also a director of Industrial National Bank of Providence, R.I., and of Protection Mutual Insurance Company. He is chairman of the Board of Firemen's Mutual Insurance Company of Providence, president of the Appalachian Insurance Company of Providence, a member and past president of National Fire Protection Association, President of Rhode Island Society for the Prevention of Cruelty to Animals, a member of American Society of Mechanical Engineers and of Providence Engineering Society. His office is at 150 South Main Street, Providence, R.I., and home at "Windholme," Warren, R.I.

As of March 31 our Class is credited with contributions to the M.I.T. Alumni Fund of \$12,255.24, an average of \$170.00 each from 72 contributors. Our Fifty-Year Class Gift Fund is also progressing steadily. We are hoping for and anticipating pledges, and checks or stock certificates or bonds, from many of you who have not as yet taken part in this project. — BRYANT NICHOLS, Secretary, 23 Leland Road, Whitinsville, Mass. PHILIP B. WALKER, Assistant Secretary, 18 Summit Street, Whitinsville, Mass.

· 1908 ·

We have another world traveler judging by a note received from Waldo Morrison: "We got home from Europe on April 2. I found a pile of magazines waiting for me. As usual, I picked out the four last Technology Reviews and turned to Class Notes. There was some bad news. Linc Mayo will not be with us for next Alumni Day. He surely will be missed. That news was in the March number which informed us that you had a broken leg, but didn't say how the break occurred. This omission of the cause is very bad reporting and it leaves me wondering whether it was the force of gravity and contact with some unyielding object. You should be interested in the 1898 Class Notes printed in the April number of The Review. Lester D. Gardner's letter is there, reporting on the Gravity Research Foundation of New Boston, N.H., organized by Roger Babson, to study and harness gravity and thus to bring benefits to mankind which are almost beyond imagination.' Don't ask me what the benefits anticipated are as I remember Freshmen physics course had me on the ropes. As I look at it, without gravity we would be soon cut off and we would fly away.

"We left Stowe to escape the snow and ice on January 1, but instead of our usual Arizona trip we flew to Lisbon, Madrid, Palma de Mallorca, Barcelona, Paris and London. We did not escape the unusually cold weather even in the Balearic Islands. Nevertheless, it proved to be one of the most exciting if not restful trips I ever enjoyed in winter time. I hope to see you

and others of '08 in June."

The sympatny of the Class is extended to Charlie Steese in sudden death of his son, Charlie, Jr., M.I.T. '53 on April 12, 1956, in California. The following will be of interest. "Charles, Jr., was born in Detroit, Mich., in October 1929. He attended the public schools in Cambridge, Mass., for the first six years and was a member of the male choir of Christ's Church (Episcopal) in his eleventh year. At the age of 12 he started his pre-college education at the Northwood School for Boys, Lake Placid, New York, and was graduated in 1947, cum laude, from the Millbrook School for boys, Millbrook, N.Y. He received his S.B. in Chemistry with Physics as a secondary subject, in 1951 from the California Institute of Technology. In 1953 he was granted an S.M. from M.I.T. After completing two years of military service at the Army Chemical Center in Maryland a few months ago, Charles, Jr., had returned to the California Institute of Technology where his course of study and research work were well underway toward his Ph.D. This degree would have been attained in another 18 months."

A note from Charlie, dated April 22, from his home in Harrison, Ark., said: "Friday morning the 27th will see me on the road back to California for the probate court and final settlement of the estate. Do not feel the need to write me as I shall be on the go and the letter will probably follow me and be eventually returned here. I told Frank Towle some time ago that I would go to the extra reunion on the Cape in June if one is held there this year. I expect to attend the Dickinson Commencement in Carlisle over the first week end and be with 1908 over the second week end in June. Count on me to attend and I shall write to you from some place in the event I am unable to be present."

Sam Gardner writes from his new home in Florida: "We've been here over nine months and I am ashamed that I haven't written to give you my address. Mail should be addressed to P.O. Box 669, Oakland Park, Fla. We are enjoying our new house very much. Have had a nice winter except for an unusual 10-day cold spell in January. Our heating bill for the winter was \$28, some difference from that of our Wakefield house.

"Our Classmate, Claude O. Brown, lives in Ft. Lauderdale, about two miles from me and I see him occasionally. Seems well and hearty. My wife and I expect to come North for a visit with our children the latter part of this month, staying there for June. I hope to attend Alumni Day, but will be unable to attend the Reunion on the Cape."

Harry Lord, another Florida resident, writes: "I was sorry to hear of your broken leg. I hope that by now you are well on the mend. I am making plans to be at the Reunion, but Mrs. Lord will spend the time visiting our children. Let me know the details when they are completed, and put me down as a single entry."

Am sorry to report the death on January 19 at Chicago, Ill., of Matt Hayes. Had not seen Matt for some time, but still remember a very enjoyable dinner and pleasant evening spent at his home when he was located in Buffalo.

Best wishes for a very happy summer. Let us hear from you. - H. LESTON CARTER, Secretary, 14 Roslyn Road, Waban, Mass. LESLIE B. ELLIS, Assistant Secretary, 230 Melrose Street, Melrose, Mass.

· 1909 ·

More than once we have told of "Homewood," the lovely home of King, III, and Mae Bullens located in Southern Pines, N.C., and that members of '09 are always welcome. The recent visit of George, II, and Marcia Wallis to "Homewood" only confirms what we have already said. George writes as follows: "Dear Chet: On our return from Florida the last part of March we visited the Pinehurst, N.C. country for a little golf. We stopped at the Mid Pines Club at Southern Pines. There are eight golf courses within a radius of five miles from this club. We had a very pleasant visit with King and Mae Bullens, who have a very attractive home and gardens in the Knollwood section which is midway between Southern Pines and Pinehurst. About half of their acreage, amounting to five and one-half acres, is very attractively planted with azaleas and camelias and is opened up occasionally to the local groups. To give you some idea of the extent of the gardens, King told me they lost four thousand of their azaleas in the storms and cold weather a year ago. King and I, with two of his friends, played the number two course at Pinehurst, where King is a member, and it was a very en-

jovable occasion. Art, I, and Betty Shaw were also in Florida this spring. We have received the following letter from him: "Betty and I had hoped to look up Jim Finnie during our annual trip to Florida but he had died before we left the North. I saw no Classmates on our trip this year. Except for a week at Homestead for some 'birding' in Everglades National Park, we spent all our time at Gulf Ranch on Longboat Key, Sarasota. The Park this year was disappointing owing to low water and highway construction; fortunately we have vivid memories of the profusion of wild life there in a previous year. We were pleased to have been bathing and basking in the Gulf sunshine while the grim spring snowstorms were going on at home! You will be glad to learn that our son Bob (M.I.T. '42 and Harvard Med. '45), who this time last year was at Warm Springs, Ga., for treatment of the polio damage he suffered in the fall of 1954, has resumed his practice and is again performing the vascular operations in which he has specialized at Mass. General Hospital. While he is still somewhat handicapped, his recovery is little short of miraculous and improvement still proceeds. Bob's wife and four children, all of whom had the disease at the same time, seem to have quite recovered. I have started to think about the Class 50-year Fund for which Jim Critchett drafted me more than a year ago. I hope to get together soon with Mollie Scharff and others to crystallize some definite plans and may then want to use your columns in The Review for promotional purposes to supplement any separate appeals we may plan to send." Incidentally, during one of their former trips from Florida, Art and Betty also stopped at "Homewood" and practically repeated what George has said of the hospitality of King and Mae and the

beauty of their home.

In the middle of April we received the following letter from Mayo Hersey, II: "Dear Chet: Shall you be at your office on Wednesday, April 25, or on Thursday morning, the 26th? I am planning a short visit in Cambridge during that period but don't come in on purpose. My work continues as Technical Consultant at the U. S. Naval Engineering Experiment Station. I completed the temporary assignment as Acting Head, Developments Branch, Internal Combustion Engine Laboratory and am scheduled to retire August 31 of this year. Committee responsibilities for the A.S.M.E. occupy spare time." Unfortunately, because his mail at a Boston hotel was not delivered to him, Mayo missed seeing the Secretary, although both of us were in Pierce Hall simultaneously that afternoon. However, we talked with each other on the telephone. Mayo retires this fall from his position with the Navy and hopes to establish some connection with one of our Boston engineering schools where he may have opportunity to lecture, perform research, and revise his book, Lubrication Theory. As most of us know, Mayo is a recognized expert on lubrication and his book is a standard text on the subject. We shall be looking forward to seeing him next fall.

Many times we have told of the generosity of Derick Hartshorn, II, in his contributions to the Class treasury and to the Institute which are credited to our Class fund. We were more than pleased to receive the following letter from him from Fort Myers, Fla., in which was enclosed a generous check made out to the Institute for credit to our Class fund. "Dear Chet: For a retired man I have been fairly busy. My wife and I took a trip to Europe last summer and had a very enjoyable time. In part of my spare time I keep busy designing gadgets of various kinds. One that seems as though it might pay off soon is an automatic thread chasing attachment for use on machine tools where dies are not available or not suitable for the work involved. I have also been doing some residence building on a small scale. Just now I am building a lawn cleaner which I hope to give a tryout before I go North, May 15. I will be in Johnsonville, N.Y., until about October 10, when I will return here." The letter closed with "fraternally" for which we are most apprecia-

tive.

In the March Review we told of Mrs. Delos (Emma) Havnes having sent us a card from Tokyo while on her second trip around the world. She was still on her way on February 25 for we received a card from her sent from New Zealand on that date showing her hotel, the "Hermitage" located in a valley with high snowclad mountains nearby. She said, "Am at this hotel overnight. What fun you would have taking pictures! This country is full of beautiful surprises - lakes, mountains, waterfalls, caves and glaciers - and 42 million sheep. Fly to Australia Sunday."

In the November Review we told of our interview with Kenneth Trimingham, XIII, in Bermuda citing the fact that his son, DeForest W., was a skilled yachtsman and in the summer of 1954 captured the Prince of Wales cup in the International Dinghy Races held in England. The leadership of Forest in yachting activities came to our mind when we read the following in the Boston Herald, April 27, relative to the participation of 14 Massachusetts sailors in Race Week sponsored by the Royal Bermuda Yacht Club. "Today, the tars found that even this storied hunk of coral can have a fault. The day's races had to be called off because of a lack of wind. 'That's the first time in recent years I can recall the breeze fading so badly,' said DeForest 'Shorty' Trimingham, the island's foremost dinghy skipper.

Some of us have received a card from Molly, XI, not only telling of his change of address (at the end of these notes) but also listing five other consulting engineers at the same address with the statement that they "announce the continuation of their respective independent professional practices in joint offices." One of the five other consulting engineers is "Samuel A.

Scharff," Molly's son.

Recently we received from Art Shaw, the notice of the death of Jim Finnie, VI. Art and Iim had always been the closest of friends for they both lived in Clinton, Mass., and together prepared for the Institute at the Clinton High School. Ever since graduation Art has known more about Jim and his activities than any of the rest of us. Accordingly, we asked Art if he would write the tribute to Jim and he has done so as follows: "James Irving Finnie passed away in Hollywood, Florida, February 12, 1956, four days after his 68th birthday. He is survived by Ann G. (Sjostedt). Jim was born and grew up in Clinton, Mass., graduating from High School there in 1905. Following graduation from M.I.T., Course VI, in 1909, he entered the commercial field first in the merchandizing of electrical equipment and later in the manufacture of electrical supplies, particularly insulated wire. Contact with problems relating to rubber ultimately led him to the management of the Stedman Products Company in Braintree where he continued until this plant was taken over by the Armstrong Cork Company in the thirties. During the depression he took an active part in the leadership of the Forty-Plus Club which accomplished so much toward placing middle-aged executives in those times. In the wartime years he did field work for the War Production Board. In recent years he has divided his time between Florida in the winter and his home at Hampton Beach, N.H., in the summer. Many of his Classmates will recall 'Red' Finnie's extracurricular activities at M.I.T. including Class football, Technique management board, Class Day Committee and Osiris. He was Junior Class treasurer and vice-president in senior year. He may be best remembered for his participation every year in Tech Show. Subsequent to graduation, Jim was the 'life of the party at many of the earlier Class Reunions but his friendly and sunny presence has been greatly missed at Reunions in recent years. All Classmates who knew Jim Finnie will feel a sense of personal loss at his passing." (The last item in the Class Notes which referred to Jim appeared in the

November 1955, number and told of his

moving to Hampton Beach.)

In both the May and June numbers of The Review we told of the passing of Chet Pope, X, and of having written to Mrs. Pope expressing our sympathy to her and her family. We have received the following note from her telling of the last few months of Chet's life and of his indomitable will and courage throughout: "I am very sorry to be so slow about answering your very kind letter of March 17. It came just a day or so before I left with our daughters for a short trip to Puerto Rico for their spring vacation. Then on our return I had to go to the Cape to close out and move from our beloved Red House, which I sold the day Chet passed on. We had had it on the market during the winter, as it seemed quite improbable that Chet would live to see another summer there and it was too large for just the girls and myself. Now that chore is done and I am getting my desk unearthed from a mountainous pile of unanswered correspondence. These past few months had been so grim that we could not wish them prolonged. They had been a series of emergencies with Chet being rushed to the hospital by ambulance three times, each time not expected to live. His indomitable will and courage pulled him through again and again. Last summer we had moved into a lovely new home on one floor and he had a cheerful corner room with sun pouring in all day, a TV with remote control which he could control from his bed, and his beloved French poodle always on the bed beside him day and night. I was happy he could be home to enjoy all this the last month of his life, as he loathed the hospital and fretted so badly while there that it did him no good. Someone from his business came to see him every day and kept him informed as to what was going on there, although he was not able to go himself all winter. He had built a fine new factory in Clifton, N.J., just four years ago thereby celebrating the 25th anniversary of the founding of Pope and Gray, Inc.

This is the last number of The Review until November. We Class officers wish to express our appreciation to the members of the Class who have kept us so well supplied with news during the year. We have not been obliged to miss a single number. We further wish you all a most pleasant summer and so long until fall.—CHESTER L. DAWES, Secretary, Pierce Hall, Harvard University, Cambridge 38, Mass. Assistant Secretaries: Harvey S. Pardee, 10445 Johanna Avenue, Sunland, Calif.; MAURICE R. SCHARFF, 250 East 43rd Street, New York 17, N.Y.; GEORGE

E. Wallis, Wenham, Mass.

· 1911 ·

Last month we told you we had just heard of the death of Classmate Leland D. Wood, VI, with no details available — but now we have some details from a Yarmouth, Maine, dispatch: "Leland D. Wood won't wave at the engineers on the Maine Central Railroad any more. He died recently (March 20) at a hospital at North Grafton, Mass. Wood, 69, moved to Maine six years ago after retiring as manager of the Norwich (Conn.) Gas and

Electric Company. Each morning he left the home of his daughter, Mrs. Charles J. James, for the Tuttle Road crossing to salute the train crew. In the afternoon he went to Yarmouth Junction.

"Wood, a native of Taunton, Mass., was a graduate of M.I.T. and he also had been manager of a Hudson (Mass.) power company and while there was a district governor of Rotary International. He also leaves a son, Leonard, of Schenectady (N.Y.), and a sister, Mrs. Leroy F. Bur-

roughs of Providence, R.I."

Our own Carl Ell, XI, President of Northeastern University in Boston, was speaker at the Newton Y.M.C.A.'s annual Lenten luncheon on March 29, speaking on "Makers of Civilization." Carl is in great demand at civic affairs in the Northeastern area, for he is one of the region's outstanding educators and administrators. Originally a graduate of DePauw University, Carl graduated with us in 1911 and later received a master's degree at Harvard. President of Northeastern since 1940 (he was named dean of the College of Engineering there in 1917), Carl has honorary degrees from Tufts, DePauw, Boston University and the University of Rhode Island. Announcement was recently made in New York that N.U. with an enrollment of 7,932 students in the evening division, now ranks fifth largest in the nation, with top honors held by C.C.N.Y. with 9,214 evening enrollment.

Incidentally, there was a good picture of Carl in the April, 1956, issue of *Industry*, monthly publication of the Associated Industries of Massachusetts. He was seated among the dignitaries attending this year's annual Northeastern University dinner for co-operating employers who employ N.U. students on the work-study plan of education. More than 300 business and industrial leaders attended the affair.

At this mid-May writing it looks like a fine attendance at Snow Inn, Harwichport, for our 45th Reunion. Unfortunately this is the last issue in the current volume, so we can't report Reunion activities via Class Notes until the November issue. Classmates, however, will receive a copy of the post-Reunion edition of *Thelevener* shortly after the June 8–9–10 affair.

For quite some time now Gertrude Stewart, O. W.'s wife, has taken an active part in the Girls' Friendly Society, Episcopalian Church activity for girls in the parishes. In connection with this year's Massachusetts Diocesan Convention in Boston in late April, Gertrude reported for the combined Girls' Friendly societies of the diocese. In this the 15th year of the "summer opportunity" program annually at Holiday House, Milford, N.H., Gertrude said there would be a capacity attendance. She also said that at the annual conference this year for older girls, held at Briarwood, the subject for discussion, chosen by the girls themselves, is "Love and Marriage.'

Just received a colorful postcard from Southern California, depicting the California Missions, from Armand Peycke, II, and his wife, Dot — there on a vacation trip. They were due back in Chicago May 15th and on to New York June 4th or 5th and join us at Snow Inn on June 8th.

It was great to learn from Joe Harrington, VI, who has done a grand job "drumming up" trade for Reunion attendance from the New York metropolitan area, that Frank Osborn, III, will be with us. Frank says he'll be busy in June — what with our Reunion on June 8–9–10; the 50th reunion of his Peabody High School class later in the month, along with the graduation of his youngest son, Fred, at Trinity College, Hartford, in between. "I came here to Detroit in early April," Frank wrote Joe, "for a week's job and it looks like another month or maybe more. I am supposed to have retired, but you know how those things work out. It'll be great to see the gang at Snow Inn."

John Urquhart, XI, who retired after years and years with International Shoe Company in Manchester, New Hampshire, in 1954, has now given up his Manchester home and become a country gentleman in a suburb – address him at R.F.D. #1, Ashland, N. H. Long life and

happiness to you, John!

Having attended M.I.T. for one year or less and not having been heard from in more than a decade, the following listed as 1911 have been removed from the active Alumni List at the Institute: Miss Sarah H. Anderson, Miss Georgianna Charleston, Daniel J. Crowley, Jr., Alberico deAraujo, Juan G. Diaz, Raymond W. Frost, Jacob Goldberg, Alton S. Hallett. Henry V. Hoysradt, Julian A. Kaminski, James J. Kennedy, Armando Pauvolid, Luis Ricardo Rapelli, John A. Starbuck, Carlos A. Valverde and Shuichi Yamaguchi. Seven others attending two years, but from whom nothing has been heard in upwards of twenty years, are also being dropped from the alumni rolls: William R. Cannon, Edward J. Carey, Carlos deLanda, David J. Jenkins, Whitney B. Jones, Chapin S. Pratt and Edward I. Weisberg.

As a direct antithesis of this complete lack of interest, I hope you'll look at the final figures for this now-closing 1955–56 Alumni Fund. You'll be proud of 1911 — once again on the fore-front, with the best percentage of givers and a rather pleasing, although not outstanding, average gift. To you loyal Classmates goes the hearty thanks of a grateful Class agent

in his native Framingham.

How time marches on! It doesn't seem possible that another collegiate year and a volume of The Technology Review are about to be completed. But that's what is happening and once again please let me assure you that it's been a privilege and pleasure to supply you with Class Notes for nine consecutive issues of the magazine and please don't blame me if some of them seemed less newsy than others - you gotta "Write to Dennie" if you want Dennie to write for you. God bless and keep you all - have a good summer and when you get back from vacation in the fall: "W. t. D." - ORVILLE B. Denison, Secretary, Chamber of Commerce, Framingham, Mass.; John A. HERLIHY, Assistant Secretary, 588 Riverside Avenue, Medford 55, Mass.

• 1912 •

Announcement has been received of the association of Eric Kebbon with the well-known firm of McKim, Mead and White of New York. This should prove a most interesting association. Congratulations!

Wallace J. Murray who retired from Arthur D. Little, Inc. in January 1956, after 36 years, reports as follows: "On February 7 we - my wife, my daughter Jean and myself - sailed from New York on the Oslofjord on their West Africa and Mediterranean cruise. We visited the African Islands of Cape Verde, Canaries and Madeira and sailed through the Azores but without stopping. On the African mainland we visited Dakar, Casablanca and Rabat, Algiers, Alexandria, Cairo and Luxor. In Asia we visited Israel (Jerusalem and Gallilee), Damascus, Baalbek and Beirut. In Europe we visited Athens, Istanbul, Dubrovnik (Jugoslavia), Venice, Naples, Sorrento and Capri, Messina and Taormina, Ville Franche and Monaco, Barcelona, Cadiz and Seville, Lisbon and Sintra. We sailed from Lisbon to New York March 29. As you can see we went to about the same places that you did on your trip.

"For the present, at least, retirement will not change my life very much. I expect to continue to live and work in the same places as before but can take longer vacations, if I wish, and probably spend more time at my farm in Athol, Mass."

Hamilton Merrill breaks a long silence to write that he retired on January 18, 1956 as president of Manning, Maxwell and Moore, although he remains on the board of directors. Since then he reports being pleasantly busy with a number of interesting projects and looks forward to continuing some projects that he has never before had time to do. They started off with a five week trip to Mexico where they studied the civilization of the early Mexican Indian. Since then he has dabbled in archeology, fishing, photography and golf, sandwiched in with some community activities, not to mention two married daughters and eight grandchildren. He remarks that he was missing a lot of worthwhile things, including fun, and becomes mildly irritated when people intimate that he is about to disintegrate and ask him what he is going to do to keep himself busy. His reply - "enjoy

Ralph M. Ferry writes about his last 40 years and I quote his letter below: "Thank you for your note of March 29 and also

for your interest in myself.

"I am sending you some comments on a few of the highlights of my experience since graduation and am trusting to your editorial efficiency to pick out what you think would make an interesting para-

graph.

"Upon graduation, I went with the Aluminum Company of America, starting August 1, 1912. The first nine months were primarily a training period with experience in several departments, after which I was assigned to specific jobs. In the fall of 1916, I went to Toronto, Ontario, where the company had a plant at that time. I remained there until the end of 1922 as superintendent of this plant and then was transferred to Edgewater, N.J., as a superintendent of that plant.

"In the fall of 1929, I was transferred to New Kensington, Pa., as general superintendent, and in the early thirties, became works manager. In March of 1945, I was transferred to Tennessee as manager of Tennessee operations. While the three large plants of Alcoa, Tenn., were within the state as well as one hydroelectric power plant, two other hydroelectric plants which were a part of this unit, are located over the line in North Carolina. I retired on May 1, 1955, after being with the company 42 years and nine months.

"On October 31, 1955, the executive council of the American Society of Mechanical Engineers, approved my promotion to the grade of fellow. The official certificate of award was presented to me by Professor J. B. Jones, Vice-president, A.S.M.E., Region 4, at a meeting in Oak Ridge, Tenn., on January 19, 1956.

"Probably, the basic information supplied to the executive council, together with the citation by Professor Jones, contains more of the kind of information of

interest to you.

"On the technical side, reference was made to some of my development work which led to improvement of re-melting furnaces. Also mentioned was development work I did on a lacquering process for aluminum sheet and my contributions to the first successful non-oxidizing annealing. Also cited was my management experience and the size of some of the operations I supervised, particularly, under pressure of exacting demands for quantity and quality for military requirements, plus my interest in education and some of the successes I had in developing younger men within the company.

"In 1935, I was appointed a representative of the A.S.M.E. on a sub-committee to prepare (a) 'Code for the prevention of dust explosions in the manufacture of aluminum bronze powder.' In 1940, I was appointed as a representative of the A.S.M.E. on the main committee for 'Safety Code for Prevention of dust ex-

plosions, Z-12.

"This committee is a joint committee of the National Fire Protection Association and the American Standards Association. When a code has been processed by the Z-12 committee and approved by the N.F.P.A., it is referred to the American Standards Association and when approved by it, becomes one of its standards.

"In 1954-55, I participated in the preparation of a code for presentation to the National Fire Protection Association entitled 'Code for Prevention of Fires and Explosions from the Processing and Finishing of Aluminum and Aluminum Alloys—including processed storage of alumi-

num powder and paste.'

"I have been continuously a member of the A.S.M.E. since I joined the student branch of M.I.T. and was secretary 1911–12. (Incidentally, that year, Johnny Noyes was chairman and Charlie Carpenter was the treasurer.) After graduating, I was a junior member, was made a full member in 1921 and a life member in 1948 and as stated before, awarded the honorary membership of fellow in 1955.

"In 1931, I was one of the organizers and charter member of the Alleghany Valley Foremans' Club and was made a life member in 1945. Specific evidence of this life membership was effected by the presentation of a life membership card engraved on anodized aluminum.

"I was a member of the board of directors of the New Kensington Y.M.C.A.,

1930–45. In 1945, was elected life member of this organization and was presented with an embossed solid gold membership card. One of the founders of the Western Pennsylvania industrial conference, past general chairman, member of the board of governors over 20 years, at present (4/27/56) member of the advisory committee to the board.

"Well, Shep, if you have gotten this far without falling asleep, please accept my best regards for yourself and your family and make a note of the above address so that you will know where to look when you get a chance to come down and see us. My present address is good for at least until the 15th of May and it might hold for the rest of the summer. In any event, outside of a trip to New York and another to Canada, I expect to be around

for several more months.

We picked the Eastern Shore as a good place to retire and have been trying it out to make sure we are right. Last summer, we had a most delightful experience living in Queen Anne's County on the Chester River. This fall, we moved to Talbot County living on Trippe's Creek. The Chester River had lots of water and wide open spaces. I believe Talbot County has more shore line with plenty of water but also more protected water for bad weather. While good rents are rather hard to find, we have been fortunate in the first two places we have lived, and if we get stuck, we can always seek refuge for a few weeks at Tidewater Inn, which is a very nice place and all of us around here consider ourselves fortunate in having this type of accommodations.

"Don't forget I am putting my trust in you to pick out the kind of things that you think would suit your newsletter and good luck till we meet again."—FREDERICK J. SHEPARD, JR., Secretary, 31 Chestnut Street, Boston 8, Mass. Lester M. White, Assistant Secretary, 1230 N. E.

102nd Street, Miami 38, Fla.

· 1913 ·

Well! When you boys and gals read these notes, the 1913 43rd Reunion will have come and gone. So the next issue you will be informed who attended the Reunion; who brought who; who's the best dresed man; who's the best dressed woman (No, we'll pass this one); what he or she said to him or her and why. News is scarce, that is good news. There are hardly any chips in the barrel now, just a few splinters. Herb Shaw writes "Card is late - We just returned from four week Florida trip. Put us in the big house with the gang." We are terribly upset to receive from the Alumni Office a notice that our dear Classmate, Herbert J. Von Rosenberg passed on to his maker, December 6, 1955. If any of you other friends, particularly you architects, can write us more details we will be very much pleased to insert them in our column. Several of you good fellows have sent back your Reunion Cards with certain notations which we appreciate but nevertheless would prefer to see your smiling faces at Coonamessett in June: Arthur Hurst states "Sorry, must be in New York that week"; Wemple notes: "Conventioneering White Sulphur Springs, Va."; Ken Reed "Sorry, Philip, I cannot make it this year"; Gene Burrell from Fort Worth, Texas reports "Am sorry — too remote for leave scheduled in June"; Harold Marsh of Portland, Ore., says "Too long a hike for me, maybe in 1963"; Ken Hamilton very briefly states "Sorry cannot come"; Professor Butts from good old Lehigh reports "Congratulations on a fine program. Wish I could be there. Expect to make it for our 45th."

William Guild from St. Petersburg, one word "Sorry"; From Picayunne, Mass. comes word from our punny friend Mayo Tolman "I find that my job of being 'a farmer's husband' for the past 17 years precludes attending any Reunion, even if it didn't I would not swap for any other job." We've heard many stories about the 'farmer's daughter" but not the "farmer's husband." From the Shores of Florida comes word of Ralph Rankin: "Wish I could be there but don't expect to be North in June." Fred Herson relates "Sorry - can't make it this year. Am trying to get over a coronary thrombosis that hit me early in the year." We also regret that you will not be with us, so get well soon, Fred. John Foley of N.Y. writes "Please tell Bill Mattson I'm sorry I can't make it.'

Gordon Howie states: "We are sorry not to be there"; Ernest Weller will also be among the missing; "Sorry to miss it, but must be in Chicago then"; Si Champlin adds "Busy preparing to move to California"; business or retirement? From Dutch Franzheim "The invitation is most alluring. Congratulations to whoever got it out! Terribly sorry that any long trips are out of my present scope. Good luck to you all."

Al Conant amends "Still pretty much confined to the house except for trips for checkup." Glad to hear from you Al.

John Ladd reports "Sorry cannot make it." Jovial Dave Nason states "I have fishing dates in New Brunswick in May and in Northwest Ontario in June, which cannot be disturbed. My best wishes to you all." Are you tanning fish-skin now? Of course Ed Hurst comes through with a nice epistle, and we quote in part: "Of course, I regret that I will not have the opportunity to enjoy a glorious Reunion with my wonderful Classmates. I will be thinking of you all and sincerely trust the Reunion will be a grand success and delightfully enjoyable. Please extend to Fred Murdock cordial greetings and warm expressions of my high esteem. I think you gentlemen are doing an excellent job with the Class Notes, particularly in view of the fact that most of us are rather loath to write about ourselves even though the pertinent data might be of interest to one's Classmates." Allen Brewer surely does help the news department, either 'for better or for worse' and he informs us " 'The better the day, the better the deed,' as the saying goes. So, here's my check for Reunion year dues, as you reminded us in the latest issue of The Review. I say the better the day, because, if my memory of colonial affairs is correct, today, is Patriot's Day in New England, and incidentally the day of the BAA Marathon Run. You see, I've not forgotten my early training and loyalties, to the 'old country.' As you may have presumed, I cannot come so far to the Reunion this time, but I hope both Maurine and I will be making it in '58, if all goes well. The new home here finally is finished as far as construction goes, but now we are facing the chore of interior decorating and fixing over some of our antique furniture. Fortunately, we both have not forgotten that 'Rome was not built in a day' so we are taking our time about getting finally settled. In between swinging a paint brush, I am still working on consulting editorial work. It is a beautiful set-up. Nobody is in a hurry and when the spirit moves me I climb down off the ladder and get going on the typewriter. I couldn't have a nicer deal for retirement occupation. Besides this, I'm acting as consulting editor for Lubrication Engineering and writing one of the technical editorial columns for the publication. Added to that responsibility I'm also editing the chapter on lubrication for the next (10th) edition of the Refrigerating Data Book which is sponsored by the American Society of Refrigerating Engineers. Meanwhile, my oldest son has been busy in another way. I've just heard that his wife has presented him with his fifth child. That makes three girls and two boys for him. This coupled with the output of the other two boys makes me a grandfather for the ninth time. Somehow it makes me feel old. This is about all the news from 'down here.' Its nice to work in shorts and tee-shirt; my heart bleeds for you poor northerners and your weather conditions. My fingers are crossed however, against the chance of getting the hurricanes next time." Well! you do keep busy, Allen, and I am glad you can sleep nights.

Time marches on. We Boston '13 men were terribly shocked to pick up the paper the other morning to see the death notice of one of our most distinguished and beloved Classmates, Rusty Sage. His loss is a great one not only to his dear family, including our own Classmate, Charlotte, but to all of Technology, its organization and the hundreds of graduates whom he assisted in one way or another. Mere words cannot express our feelings of sorrow, but Rusty has left a place in our lives and hearts which can never be filled. Let us all stop for a minute in our busy days and say a prayer for our beloved departed Brother Nathaniel McL. Sage. He was honored by hundreds and buried on May 18, 1956, with a very appropriate service at the St. Paul's Church, Brookline, Mass.

An announcement in the business news from the Cincinnati Times Star, April 14, 1956, has been received which stated that George H. Clark after thirty years association with the Formica Company has resigned. From 1943 to 1955, George was vice-president in charge of engineering and then became assistant to president, D. J. O'Conor. From 1947 to 1951, our boy, George was president and board chairman of the Society of the Plastics Industry. He will continue his association with his company on a consultation basis on engineering problems. Well, welcome to our ever increasing 1913 retiring but not dormant club. So without further ado, I guess we did find a little substance even on the bottom of the barrel. If it's news you want, then write your scribes what you doing or, better, thinking. Still hanging on. - Frederick D. Murdock, Secretary, 88 Rumstick Road, Barrington, R.I. GEORGE PHILIP CAPEN, Assistant Secretary, 623 Chapman Street, Canton, Mass.

· 1914 ·

In April, your Secretary had occasion to be in Belleair, Fla. This is within ten miles of Dunedin on Tampa Bay, where our Classmate, Rucker Bristow has made his residence for the past 30 years. It is hardly necessary to add for those who know Rucker well that a reunion was promptly arranged. Rucker has attended several of our five-year reunions and from time to time has also visited the North in connection with his citrus processing activities. It should be recalled that he is one of the foremost developers in canning, freezing, evaporating, and other treating processes, of oranges in particular. He has recently developed a new process which appears to be revolutionary.

To spend a day with Rucker is to be bitten hard with the Florida bug. He called my attention in many ways to the advantages of living in Florida. For example, he is interested in orange processing but also has a considerable acreage of land which is paying far more than its keep and the value of which is soaring. Citrus of all sorts grows everywhere. Hogs, turkeys, and other livestock run around for profit, of course. In addition, every few days a car of funeral greens is shipped to the northern market. Also, as would be expected of Rucker, he has his house filled with mechanical gadgets and has a well equipped shop. He still flies his own plane. At the present time he is helping his local church put on an addition and

also is active in the local M.I.T. Club. A

cordial welcome will be extended to any

Classmate coming his way.

The reason that your Secretary happened to be in the area was that the Scientific Apparatus Makers Association was holding its annual convention there. Your Secretary has been a former president of the Association and is currently a director. For some unknown reason the Association awarded to your Secretary its top award, which corresponds to the usual achievement award in other associations. The award was made "in recognition of his leadership, vision, and devotion to the growth and progress of the scientific instrument industry." Perhaps it should be added that Rucker and your Secretary postponed our reunion until after the convention adjourned.

At the Western Alumni Regional Conference held this spring in Los Angeles, the second award ever made by the Alumni Association was presented to our Classmate, Donald Douglas. The presentation was made by the Alumni President, Dwight Arnold. The citation read, "The Alumni Association of the Massachusetts Institute of Technology honor Donald Wills Douglas, loyal alumnus of the Class of 1914, who as a pioneer in the aircraft industry has exemplified the roles of creative engineer and courageous business executive." In describing the achievements of Douglas, reference was made to his work in building the first airplanes to lift their weight in pay load, which gave modern transportation a new dimension, and to the fact that more than one-half the aircraft operated by airlines throughout the world are built by Douglas.

As happens nearly every month, word has been received of the death of another Classmate. Robert Child Doremus II died in Detroit on March 18. At the time of his death, Doremus was the chief engineer of the Detroit Ice Machine Company. He was married on August 25, 1918, to Hazel Bell. She and a daughter survive him. When he entered the Institute, Doremus' home was in Montclair, N.J. He prepared at the Herman School. While at the Institute, he was a member of the Beaver Club, manager of the Glee Club, and member of our Freshman football team. In our Sophomore year he was a member of our Class tug-of-war team. He was also a member of the Technique Committee and of Phi Gamma Delta fraternity. During World War I he was a first lieutenant of ordnance, serving in the artillery section of the production division of the Detroit District Ordnance Office.-H. B. RICHMOND, Secretary, 275 Massachusetts Avenue, Cambridge 39, Mass. H. A. Affel, Assistant Secretary, 120 Woodland Avenue, Summit, N.J.

· 1915 ·

What a Class! On April 27 at the Faculty Club, M.I.T., 36 Classmates with sons and guests gathered for a rousing and successful evening. After cocktails and an enjoyable dinner supervised by Bill Morrison, club manager, we introduced the guests listed below and had a few words from Max and Clive on the splendid contributions 1915 has made to the Alumni Fund. Jack Dalton added his compliments to the Class and spoke of Alumni work and M.I.T. activities. As gay and bright as these Class dinners usually are, we had an additional bit of humor to lighten the evening. We gave Henry Sheils a little legpulling by challenging his desirability, qualifications and fitness to be Class Treasurer. The active and lively discussion led by Pirate Rooney, Pop Wood, Ed Sullivan, Ben Swain (who was "shocked") ranged from a motion to have Henry bonded to a motion to have him thrown out of the Class. Jack Dalton put on a fine act of righteous indignation at all this. Finally, Henry "saved" by the pleas of young David Hamburg and Jim Hoey, with the final decision to let him be. No one got hurt - everyone got a laugh and Henry's guest, Bob MacLellan, who happens to be president of the bank where Henry deposits Class funds had a particularly good laugh from it all.

The long distance competition was as close as the current National League race with Whit Brown - Concord; Fred Waters - Marblehead; Loring Hayward -Taunton; Max with Lou Clement - Framingham; all giving way to Stan Osborne -Hartford, Conn. and Speed Swift with guest Charlie Hemenway - New London, N.H.; who in turn bowed to the winner Doug McMurtrie with his son and guest from far off Berlin, N.H. and Bur Swain from New York City. A great tribute to the unfailing interest and devotion of

these men to come these distances. We signed and sent "get-well" cards to our sick list of Evers Burtner, Hank Marion and Al Sampson.

Evers' letter follows: Al is back in circulation completely recovered but no word from Hank who is tough enough to

have recovered anyway. "One never realizes how sickness strikes. I have been through a rugged stomach operation, but thanks to careful skilled work and the progress of modern surgery, to date have suffered no pain. Judging from the good number of Classmates who signed the getwell card you had a fine dinner of our loyal Class. I am sorry to have missed it.'

Last minute cancelations from Wayne Bradley, Frank Scully, Louie Young, Larry Landers, John Homan (in Florida) Wink Howlett (in Spain), Sam Berke (in Hawaii) with these letters from Ben Neal and Larry Quirk robbed us of the company of these charming Classmates.

Ben Neal: "Much as I would like to, I see no chance of getting down to the dinner, but miracles can happen, and one might this time. Not much news - the local M.I.T. Club had a plant visitation at the Carborundum Company a couple weeks ago, and Bill McEwen came up from Wellsville, and properly fortified, we attended the dinner and made the rounds. Proportionally I was proud that '15 was well represented, as when we got there we found George Easter and Burnham Field. Bill came back and spent the night with us, which we very much enjoyed, and Bill himself is doing a grand job in living with the tragic blow that came to him in the illness of Bill, Jr."

Larry Quirk: "I was all set to attend next Friday's dinner and have a weekend to look over your city as my last visit was in 1932. In fact, I sent in 'yes' on the card.

"I have been advised that my 39th wedding anniversary is next Saturday. So, as I have to live here, I'd better stay home. I'll see the gang in New York next year - the man being willing."

Present at the Boston Class Dinner were: Whit Brown, Marshall (Jack) Dalton, Dinger Doane, Sam Eisenberg with a guest, his son-in-law, Commander R. E. Peters, Loring Hayward, David Hamburg, Jim Hoey, President 1943, Peter Hooper, Clive Lacy, Azel Mack, Frank Murphy with a guest, his son Francis E. X. Murphy, Harry Murphy, Pete Munn, Doug McMurtrie with guests, his son Richard L. McMurtrie, and John Barrington, Archie Morrison, Stan Osborne, Wally Pike, George Rooney with guest, R. W. MacCormick, Ed Sullivan, Jac Sindler, Henry Sheils with guest, Robert MacLellan, Bur Swain, Speed Swift with guest, Charles M. Hemenway, Bob Warren, Fred Waters, Easty Weaver, Carl Wood, Max Woythaler with guest, Lou Clements.

Doug McMurtrie's son and guests were (unfortunately) Harvard 1953 classmates so that they saw an excellent example of what makes successful Class spirit. David Hamburg, Lou Clements, Bob MacCormick, Frank Murphy, Jr. and Commander Peters are all old-time guests. We mentioned Henry's guest above. Speed's guest Charles Hemenway is a retired banker living up near Speed. They were all welcome - it's so nice to have these sons of the Class and guests with us and we hope they, with others, will always join with us.

Ralph Hart sent me a clipping from a recent trade journal with a picture of the Chemistry Department staff at M.I.T. 1899-1900. It gives you a nostalgic feeling - us in V and X - to look at these old

teachers of ours and is a grim reminder that time marches on, for it was only a short time later, in the fall of 1911, that we were studying with these same oldtimers! Thanks, Ralph, for that picture.

At the 1956 Annual Meeting of the Massachusetts Guernsey Breeders Association at Framingham, Mass., on April 7, Herb Whitcomb was awarded a productive achievement certificate. His farm is in Littleton, Mass. Congratulations, Herb. Here are some more interesting letters that came with Class dues. And, by the way, have you paid yours? We can trust Henry now.

What a tough life Harvey Daniels leads: "Enclosed check as requested. We still have our home in Washington, but are away at least half the time - summers in Minnesota, winters in Florida and visits in between to New York, New England and Toronto, Canada, to see family and relatives. Our older son with wife and 3 children lives in Minneapolis and our younger son with wife and two children are in Toronto. Greetings and best wishes to you.'

Alton Cook: "I enjoyed being at our Class dinner in N.Y. this past January. Suggest that this be made an annual af-

fair. My best.

Herb Anderson, another "sufferer:" "Enjoyed our get-together in New York very much in spite of being a cripple. Always so pleasant to be with old Classmates for an evening. We missed out on reservations for the Windward and Leaward Islands but are planning an excellent substitute which will have us home for the pleasant spring weather in

the country early in April."

It's nice to have this fine letter from Bob Schmucker and many thanks, Bob, for your interest and those kind words: "As to Class Notes, I read them faithfully and regularly with interest. Last summer my wife and I took the train to St. Louis and thence to Denver. We had a few hours to spare and drove around the former city in what used to be called a 'rubber neck' bus, fortunately air-conditioned, as the heat was insufferable. Denver had changed a lot since 1923 when I was there last. My son, M.I.T.'39, flew out from N.Y. and we hired a car to drive around the state, which I left in 1910, except for a short visit."

Bridge Casselman, 130 Campbell Street, Harrisonburg, Va., also writes a fine letter. Nice to hear from you, Bridge: "Possibly I may seem to have disappeared for a while, but I was only in a state of suspense. As you know from my change of address, I finally moved with my family to the old dominion state, when American Safety Razor Company moved here from Brooklyn. It took us many months to make up our minds to leave New York, but we were lucky enough to find and move into the only apartment house between Richmond and Cincinnati that is as nice as the one we left in New York. We find many living conditions better than they were in New York, such as driving and parking and climate. But it will be some time before we get over missing our New York contacts, especially the Alumni Club, and the occasional 1915 gatherings. And arranging to get to Boston for Class Reunions may be right difficult. Retirement

for me is some year hence, after which my time is my own. Until then continue to send me Class dues bills which I am happy to pay as usual. And if you all ever come down this way on your best route to Florida, be sure to look me up."

Allen Abrams writes: "How good to have your recent note — that is, it was recent to me since I have just returned from a two-month trip and therefore did not see it previously. I am not sure whether I will get to commencement this year but certainly hope that our paths may cross and that you will drop me a line occasionally. I am setting up my own office in Wausau, going to do some consulting and carry on a certain amount of civic work.

"I am very much intrigued by the name of your home and wonder if it has any reference to liquid libation! Best regards."

A card from Sam and Evelyn Berke mailed April 12 at Honolulu: "We had a smooth flight out here. I am sorry I could not be at the Boston Class Dinner as I just don't want to miss any of them,"

Regardless of where they are, our M.I.T. public remains loyal. Ed Chapin, 1898, sent a card from Cairo showing him and his sister Marion mounted on two camels in front of the Sphinx. What an active and energetic couple. They are on that extended trip into the Orient. From Venice, Italy, young Dick Pagani IV, 1954, who attended some of our Boston dinners wrote that he is working there and continuing his architectural studies in Italy. It's wonderful for 1915 to have these fine friends in other classes.

We'll all miss Parry Keller at Alumni Day but will be glad to see him when he is in Boston. He wrote: "I have had two disappointments recently. First, I received the announcement and program for the annual M.I.T. Alumni Day on June 11. I cannot be there. A Goodyear Interplant Development Conference begins on this date and carries on for the rest of the week. I cannot be in Cambridge and Akron at the same time and Akron wins. Second, I have just received the cordial invitation to the 1915 Family Cocktail Party at the Algonquin Club scheduled for the afternoon of Alumni Day. There should be a law.

With the preparation of these notes we are looking forward to the pleasure of seeing many of you at Alumni Day and at our Class Cocktail Party, details of which will be reported in our opening column in the fall. Meantime, a happy and healthy summer to you all and your families. — AZEL MACK, Secretary, 100 Memorial Drive, Cambridge, Mass.

· 1916 ·

We are at the final column of this Review year, and once again it has been a real pleasure for us to have had this opportunity to serve you as your Class Secretaries. We are deeply grateful to so many of you who have written us and kept us well supplied with news items for the column. As an example of the very fine type of letter which we have been getting throughout the year, here is this interesting letter which we recently received from Larry Knowlton: "I doubt my having much of interest to report to other members of the Class, certainly nothing

that indicates any achievements of distinction. For about eight years, I have been executive vice-president of Providence Gas Company. During that period we have planned and completed a conversion from manufactured gas to natural

Joel Connolly writes: "We are again in Taipei, Taiwan (Formosa) after having home leave in the U.S. Most of our time there was spent in Fargo, where our married daughter, Ruth C. Kvaalen, lives. They have three children, twin two-yearold girls and a four-month-old boy. On our way, we made stops in the following Hongkong, Singapore-Malaya, Colombo-Ceylon, Bombay-India, Karachi-Pakistan, Beirut-Lebanon, Cairo-Egypt, Istanbul-Turkey, Athens-Greece, Rome-Italy, Copenhagen-Denmark, Stockholm-Sweden, Oslo-Norway, Glasgow and Edinburgh-Scotland, Boston-Mass., Washington-D.C., Chicago-Ill., Fargo-N.D., Billings-Mont., Portland-Oregon, Francisco and Los Angeles-Calif., Honolulu, Yokohama-Tokyo-Hikawa-Yokosuka-Kyoto-Nara in Japan, and Okinawa. We went by air to the Pacific Coast, then by S.S. President Wilson to Japan, and then

by air to Okinawa and Taipei."

We were pleased to hear from Lewis Vose who wrote: "Do a lot of travelling and have never been able to make a Reunion. Leave May 31 for six weeks, so can't make this one. During 40 years of travel, have met innumerable graduates of M.I.T. but never anyone of 1916. Seems strange doesn't it? Will be retiring soon and maybe then can make a Reunion and meet some '16 men again." That's a date. Lewis

Mark Lemmon sent along this interesting letter: "I am not going to be able to get to the Class Reunion due to the fact that as consulting architect for the University of Texas in Austin, I have to be there the last few days of May through the second of June, and it is something I cannot delegate to any of my assistants. My wife and I are leaving Dallas for Europe on June 19, departing from New York on June 22, and will return in September, so it just seems like too much to try to do in such a short time, especially in view of the fact that I will be away from the office all summer."

Somewhat belated but nonetheless very interesting, we have this news item on Frank Ross: "Frank D. Ross, Hartford, Conn., insurance executive, shot a two under par 70 today, to gain medalist honors in the fourth annual American Seniors Golf Association tournament. Thirty-two players from the field of 203 golfers 55 or older qualified for match play beginning tomorrow. . ." Sorry we can't give you the results of the match play, but we can be sure that if Frank didn't win the tournament he certainly gave a good account of himself.

Another clipping of interest from the Bridgeport (Conn.) Independent, on March 29, indicated that Dick Berger is still actively campaigning on cancer prevention. On that particular occasion, he was speaking before the Exchange Club of Easton, Conn.

Would also like to mention that Dr, Vannevar Bush made a very fine impression when he and his wife were interviewed on Edward R. Murrow's TV program "Person to Person" not so long ago.

We've just received something special—a grand letter regarding the doings of Ted Jewett, written by his good wife Alexandra at Ted's request in response to a recent bid for news. Ted is doing all right! He's vice-president (and director) of Spencer Kellogg and Sons, Inc., of Buffalo, N.Y. makers of linseed oil, and so on. Listed among Ted's outside activities are: board of directors, Erie County Savings Bank, Barcolo County; trustee of Buffalo Academy of Fine Arts, Buffalo General Hospital, Children's Hospital, Buffalo Planning Association. Hobbies are fishing and hunting.

It is with much sorrow that we report to you the passing of our good friend and Classmate Tom Berrigan, who suffered a heart attack on Thursday, May 10 and died on May 11. We surely will miss him. He was "former director and chief engineer of the Boston Metropolitan Sewerage Works, . . . former senior engineer with the Boston Transit Department, also had served on the Water Pollution Control Advisory Board of the United States Public Health Service. A lieutenant commander during World War II, he formerly was assistant district public works officer of the First Naval District and chairman of the Merrimac River Valley Sewerage Board. He was a graduate of M.I.T., Harvard and the Northeastern Law School. He was a member of the Catholic Alumni Sodality, the American and Boston Societies of Civil Engineers, the American Society for Testing Materials and the Massachusetts Bar Association. Last June he set up private practice in law and engineering, with offices in the Statler Building in Boston." Since we learned of his death shortly after it happened, we were able to have flowers at his wake in the name of the Class; and Izzy Richmond represented our Class at the funeral. We also received word of the passing of Fred Glen. This information came to us from the Alumni Association office and they referred to a letter they had received from Fred's father telling of the death but giving no date or particulars.

That winds it up for this season. We'll be in there pitching again in the fall.—RALPH A. FLETCHER, Secretary, Box 71, West Chelmsford, Mass. HAROLD F. DODGE, Assistant Secretary, Bell Telephone Labs, Inc., 463 West Street, New York, N.Y.

1917 •

From Dix Proctor: "I was very pleased this past summer to receive a visit from my old friend of Freshman days, Bill (Allison R.) Williams. Unfortunately, our luncheon was terminated rather abruptly due to sickness in the family, so I did not get too much time to get up-to-date.

get too much time to get up-to-date.

Paul Flagg writes: "I am still in the insurance business. I must be one of those horrible examples of having received fully all of the best training in the country and then because I did not extend myself to use it, I lost all but the basic fundamental concepts which can never be forgotten. Even so, my good wife and I are very happy. We both do all the church work we can. And we play as hard as we can."

Ken Richmond: "Little of general interest has happened to me since I wrote in 1955 and in 1954. Fortunately my big family continues in good health, as do I.

Irving Fineman says: "Yours of the 3d did not reach me before my birthday because I've been out here in California, lecturing and working on a new book; but I'm on the point of returning to my home in Vermont with the manuscript of my seventh novel, which I've just finished. This one has to do with Homeric times; but I haven't quite relinquished my interest in science, as witness my recent lecture on The Influence of Science on the Arts at Cal Tech, where my son, Joe, is; and my next projected novel is about a nuclear physicist (my fourth book, Dr. Addams was about a bio-physicist).

Bob Blackall: "I received your letter dated April 3, requesting a yearly report on the anniversary of my birthday. This brings to mind a certain sad fact that we get older and older and don't like to look too much on the future and our past is never a pleasant thing to reflect upon. I can only say I am getting older and older and feeling less and less active. Like myself, my family is aging and one by one as the grandchildren come along I am feeling more and more pride at the number of grandchildren I accumulate. My business keeps me busy and I haven't too much outside interests, but all in all, it is a happy life and I enjoy it."

Clair Turner: "April 28 will be my 66th birthday and somewhat of a milestone on the way down on the western slope. Mrs. Turner and I will be in Rome.

Ralph Ross: "As I recall it, I haven't reported in since before I moved East from Chicago in 1951. At that time the long lines department of A. T. and T. Company underwent an extensive reorganization for the purpose of decentralization. After the dust cleared away, I found myself in my present position of plant operating engineer. As such, I head an operating staff group the principal functions of which are to prescribe the methods and practices in maintenance, construction and other plant work, analyze the results obtained, act as consultants to the field forces, higher management, and other staff groups, and coordinate the activities of the field forces as required. My wife and I are planning to make a new life for ourselves in Danville, Vermont, a few miles from St. Johnsbury where I was born and reared, and we feel we should set about it before we get older. So, I plan to retire July 1 next. As I have written before, we have five children - four daughters and a son. The daughters have all been married for some years, are well scattered, and have presented us, so far, with thirteen grandchildren, five boys and eight girls. The oldest is in junior high school. Our son has been married about a year and will graduate from Newark College of Engineering next June in mechanical engineer-

Ken Childs: "For the past 33 years I have been with the William Carter Company, Needham manufacturers of the famous Carter's underwear. As manager of the infants and childrens division, for the last fifteen years I have been in charge of merchandising and designing these lines,

a far cry from Course II and mechanical engineering, but very interesting. A daughter and two grandchildren live in Charlottesville, Va., and my son, Ken Jr., Class of 1952, is piloting F98D jets at Harmon Air Force Base in Newfoundland. His wife and two children are there with him. Mrs. Childs and I are planning a trip this spring to Bermuda for more Kodachromes.

Bill Eddy has been a partner in the engineering firm of Metcalf and Eddy for the last 30 years. While the firm's work originally was largely civil and sanitary engineering, it has now become rather general, including also mechanical and electrical engineering and architecture. The area of practice has also become rather extended, including at the present time, a large volume of work in Greenland, Iceland, Alaska, Labrador, Newfoundland, and Spain. Last summer's holiday included a cruise in his small ketch from Nova Scotia along the coast to his home port in Buzzards Bay.

Jim Flaherty makes the headlines as witnessed by the following letter from the editor of McGraw-Hill's Factory magazine: "It is a real pleasure to advise you that the plant named above (Highstown Rug Company, Highstown, N.J.), which you helped create, has been selected by our board of editors as one of the 23 special awards in Factory's 22d annual competition for significant plants of the year. . . . Congratulations to you and those associated with you for your individual and collective contributions in creating a finer

industrial America."

Congratulations are in order for Bob Erb, who was recently named president of Melville Shoe Corporation, one of the major shoe chains in the U.S. Charlie Judge, vice-president of American Sisal-kraft Corporation, has recently become president of the Attleboro (Mass.) Chamber of Commerce. It is with regret that we report Harold A. Knapp's passing on January 19, 1956.

Rear Admiral Louis W. Perkins recently retired from active duty in the Coast Guard at a special ceremony in the 13th Coast Guard District Headquarters in Seattle, Wash.

Newman Marsilius writes: "Inasmuch as I am leaving for a European trip in two or three days, I shan't be around here much this summer. I was also over in Europe last year — around the Northern Coast of Norway. Saw the Midnight Sun and had a glorious time. This year I want to travel to Greece, around the Mediterranean and also go to Portugal and Spain. Will be in England and Paris for a while so I will sure have a busy time amusing myself, My two sons are more or less running the business so I don't have to pay as close attention as I used to.

The following is a special bulletin contributed by Class President, Stan Dunning: To do honor to Ray Stevens and Walt Whitman, 21 members of the Class met on April 25, at M.I.T. Endicott House, Dedham, Mass. It was a very enjoyable evening. Arriving early gave the opportunity to inspect the commanding French-style chateau and part of the woods and gardens of the 20 acres. After a delicious dinner, the group assembled in the grand living room. A "get-well

card" was circulated for signing to be sent to Jack Wood who is recovering from a coronary. To this was appended quite a resolution signed by ex-coronaries Loosh Hill, Gerry Thompson and Harry Sandell. Those present were besides Walt and Ray, Rudy Beaver, Penn Brooks, Ken Childs, Bill Colleary, Chris Crowell, Enos Curtin, Stan Dunning, Jim Flaherty, Art Gilmore, Heine Gartner, Loosh Hill, Clarence Holt, Hutch Hutchinson, Stan Lane, Lobby, Harry Sandell, Tubby Strout, Win Swain, Gerry Thompson, Ed Tuttle and Ham Wood. Regrets and congratulations with best wishes were received from many others. There was also some discussion about our 40th Reunion next year and the suggestion that we should have two meetings a year at lovely Endicott House.

Alan Sullivan: "My family business and hobbies remain the same as before and have previously been publicised in The Review more than they deserve. My contacts with Classmates in recent years have been rather few. Recently, however, Mrs. Sullivan and I piloted the astute Ken Lane and his gracious wife down to Doylestown, Pa., where we visited Ed Rounds.

Walt Whitman, now head of the national organization, recently spoke at a meeting of the Central Pennsylvania Section of the A. I. C. E. He said he has received new hope for mankind, as a result of his experiences as head of the recent atoms for peace conference in Geneva. Technical papers and exhibits of very high caliber were presented by all major participants, which included representatives from 73 nations. Dr. Whitman stated that none of the destructive forces of atomic energy were discussed, and that the conference showed there are other possibilities than the iron curtain and the cold war. - R. S. STEVENS, Secretary, c/o Arthur D. Little, Inc., 30 Memorial Drive, Cambridge, Mass. W. I. McNeill, Assistant Secretary, 270 Park Avenue (5A), New York, N.Y.

· 1918 ·

Those of the brethen who subscribe to The Review experienced an unexpected twinkling of their optics as they looked at the cover of the March issue. Prominently, in the right foreground of the cover photograph depicting the dinner at the Waldorf-Astoria Hotel on January 4, was a table of '18 men in all their incandescence: Nat Krass, Pete Sanger, and among others Sax Fletcher looking a bit worried over the chance of his election for the next two years as a vice-president of the Alumni Association. As president of the Ross Engineering Corporation, director of the John Waldron Corporation as well as of the Columbia Carbon Company, we know he has successfully reached the peaks in many a more responsible position. And besides, there are no other nominations for the job, to say nothing of what Sax learned about college politics on the Technique Electoral Committee.

From Ned Longley, may his tribe increase, comes a clipping from the *Engineering News Record* of last June 2, announcing Frank Creedon's appointment as an executive in the construction division of Merritt-Chapman and Scott Corpora-

tion where he will serve as assistant to the vice-president in charge of the marine and heavy construction department. Frank was recently associated with Uhl, Hall and Rich, Boston engineering firm, as acting resident project manager on the St. Lawrence Power Project. As readers of this column will recall, he was active in military and defense construction during the war and was awarded the Medal for Merit in 1947 in recognition of his services. Projects with which he was associated included the Army's ordnance and chemical warfare plant expansion program, the synthetic rubber plant construction program of the War Production Board, and construction of the atomic energy plants at Oak Ridge, Tenn., and Hanford, Wash. After serving as National Housing Expediter and as chief of the Facilities and Construction Bureau of the National Production Authority, Creedon was named Director of Installations for the Department of Defense in 1952.

Going back to Ned Longley, he reports both he and his good wife to be in high spirits, adding that brother Bob — superintendent of the Peoria, Illinois, Sanitary District is also a fulfilled and flourishing person. The rest of us will add that Bob and Ned are two wonderful people.

Word has just reached me that Edward J. Shields died on January 27. He left M.I.T. as did many others, in order to become an ensign in the Navy during World War I. After serving a long apprenticeship with Boston architectural firms, he founded his own firm in association with his two sons. Together they drew the plans for housing projects in Quincy, Hull, Watertown, Belmont, and Dover, N.H., as well as a number of churches and schools. Ed was a former president of the South Shore Industrial and Commercial Development Corporation, and a member of the American Institute of Architects.

As one returning from eight weeks of one-night stands on a lecture tour, your scribe salutes all circus performers, vaudeville troupers, and certain of the travelling salesmen. But like the experience of the strained, anxious, tired pioneers following a westward trail by Conestoga covered wagon, it has its compensations. For example, we had fresh sheets every night for almost two months! It also had its cold demands. Consider the day, starting in Jefferson City, Mo., where I addressed a college audience from 10:00 to 11.00 A.M; progressing by a stage aloof from tensions to a high school group, 2:00 to 3:00 P.M.; and then, in a death defying whoosh, racing to a 7:00 P.M. Kansas audience, waiting in eager anticipation, 225 miles away! Total assignment for the day: three lectures and 386 miles of driving. How fortunate that we had better than a yoke of oxen, or even better than a four horse double hitch, under the hood of our Detroit covered wagon. There were moments of high spirits and laughter here and there. Perhaps the most unexpected was being introduced to an Oklahoma audience by a Democratic politician who, by a delightful lapsus lingua, referred to me as Dr. Van Dyke. This was the very day President Eisenhower had vetoed the Farm Bill, giving me the inspiration to respond by saying that I do indeed wear a Van Dyke beard, perhaps because no

democrat has been willing to pay me for not raising it! Such beginnings are the stuff of which good audience-speaker rapport is made. Such beginnings are also one of the reasons why the University of Kansas has invited us to go on another lecture tour under its sponsorship. We need first some months in which to catch our breath as well as to take care of our own clients.

— F. ALEXANDER MACOUN, Secretary, Jaffrey, N.H.

· 1919 ·

The Class of 1919 met informally for cocktails and dinner at the M.I.T. Club at the Hotel Chatham at 48th and Vanderbilt on the evening of April 25. The following were present: E. J. Flynn, Ralph Gilbert, Leo Kelley, Adolf Mueller, E. G. D. Paterson, Karl Rodgers, E. R. Smoley and Don Way. It seemed like old times for the New York Section to get together again and everyone unanimously decided to have more of these parties each year. The M.I.T. Club quarters sparked the M.I.T. atmosphere for the occasion. Everyone sat around and talked until quite late while digesting a fine dinner. We heard from 24 others who wrote in that they were unfortunately not able to make the dinner and some of the notes which follow are obtained from these replies:

First of all, we were sorry to hear from J. Harold Kaiser that he couldn't make the dinner because Mrs. Kaiser was in the hospital recovering from pneumonia and we certainly hope that she is all well

Ray H. Bartlett wrote, "Stanley Works bought a plant in Miami, Fla., November 1. Since then I have been commuting between Florida and Connecticut. Would like to take time out for this gathering but believe it will be impossible."

Jim Strowbridge wrote, "Will be in

Jim Strowbridge wrote, "Will be in Cincinnati that day. Directors' meeting of company. Give my regards to the boys and girls of 1919."

Ted Shedlovsky wrote that he was sorry as he would be in Washington all that week.

Milton A. Loucks wrote that he couldn't make the dinner as he would be in Boston on business but added that "Catherine and I are still talking about our last Reunion and looking forward to the next one."

From Harry Mardoian: "Tried to make it. Am loaded with work. Too many 'flood bridges' to be let out for construction."

From John L. Riegel: "Going to Europe that day."

T. E. Shea wrote that he had a speaking engagement that evening.

All in all it looks as though the boys are keeping pretty busy.

Robert Montgomery dropped a line to let us know that his new permanent address is 1320 Devon Road, Winter Park, Fla., where he moved last October, and he is enjoying the Florida climate.

A write-up in the Independent Republican, Bristol, Conn., dated March 23 about A. Stuart Kelsey was brought to our attention. We learned that Kelsey, who is director of the Human Engineering Clinic, spoke on "Human Relations and the Changing Role of Nurses" at a meeting of administration and teaching section

of the Connecticut State Nurses Association on Tuesday, April 10, at the auditorium of the Connecticut Light and Power Building in Berlin. The article went on to say, "A graduate of M.I.T., Mr. Kelsey spent 25 years as plant manager for three industrial organizations and more recently has been management consultant in the employee relations' field. A hospital trustee for 12 years, he has made numerous contributions to the publications, Hospitals, Modern Hospital, Hospital Management and Trustee and Institutions'"

A card from Frank Reynolds: "I am busy as ever at the job of Director of Research for Bird and Son, Inc., with which I have been associated for the past 32 years. My wife and I enjoy our home and spend much of our free time during the warm weather, working around the grounds. We also have more opportunity for travel and have made trips to California, Florida and Europe during the past three years. All four children are happily married and we sometimes see our eleven grandchildren scattered around the country — California, Delaware, Connecticut and Massachusetts.

In connection with a campaign for a nine and one-half million dollar goal on a Community Chest drive in California, Bernard S. Coleman, who was chairman of the inplant federations department of the campaign received a leadership trophy as his outfit led the drive with 102 percent of quota. Bernard will be coming East in August and then leaves for a sojourn in Europe in the spring of 1957. He's been busy handling some arbitration cases for Douglas Aircraft and is awaiting his third grandchild.

We were terribly sorry to learn that Russell S. Smith passed away on April 11 and would like to extend our sincerest condolences to Mrs. Smith and her two sons, Frank and George. Mrs. Smith's address is 3855 Settle Road, Mariemont, Cincinnati 27, Ohio. — E. R. Smoley, Secretary, 385 Madison Avenue, New York, N.Y.

· 1920 ·

It hardly seems possible that that happy 35th Reunion took place a year ago. Some of us have a feeling that five years between gatherings is altogether too long a period, but on the other hand, no urgent demand for more frequent reunions has developed in recent years and unless it does, we'll play along with the standard five year program. I might mention that I have some interesting three dimension color slides of the 35th here in my office in Boston and will gladly show them to any visiting Classmates if they will drop in. As mentioned in previous notes, these slides were used by George Dandrow for a small Class gathering in New York.

According to the Worcester newspapers Ernie Whitehead was finally given a cash settlement by the courts for the automobile collision with a truck that he experienced way back in 1951. Jack Bartholomew has a new address, 2700 Berkshire Road, Cleveland Heights, Ohio. Harold Dennison may be reached at the Pilgrim Motel, Assinippi, Mass. Fred Fischer is now in Kalamazoo, Mich., address 1400 Low Road. Murray Whitaker has left At-

lanta, Ga., and is now in New Smyrna Beach, Fla.

It is my sad duty to report the death of two Classmates. Edward J. Shields'18 of Course IV died early this year. He lived in Marshfield, Mass., and was founder of Edward I. Shields Associates, with offices in Boston and Quincy. Recently he had designed a number of churches and schools and was responsible for the design of more than 600 veterans' housing units in various New England locations. He is survived by his wife, two sons and a daughter. Prof. Catherine D. Witton of the Department of Biology of Simmons College died on March 15. We knew her as Catherine Jones. - HAROLD Bugbee, Secretary, 7 Dartmouth Street, Winchester, Mass.

· 1921 ·

It's over! Our gala 35th Reunion at Pine Orchard, Conn., last month and the series of get-togethers on Alumni Day in Cambridge, which concluded our four fun-packed days of seeing each other once more, are gone but far from forgotten. Just the remembrances of those few days of rest and relaxation amongst the finest old friends to be found anywhere, are a wonderfully refreshing tonic for any ensuing moment of the hectic hurly-burly which is the business and industrial whirl. Gone for another five years for those of us who are distant from the Northeast and gone for a year, if you can be back next Alumni Day, is this brief interlude of fun, fellowship, reminiscing on the "good old days," and renewal of the strong bonds of early friendships, surrounded by an atmosphere of re-dedication to Technology and the Class of 1921. To those who came to see and be seen by a host of friends, to those who labored so long and so well to make this the finest of all 1921 reunions, to those who assisted, encouraged and gave wise counsel, to the wives and children and others, like Bill Timbie, who honored us with their delightful presence, to all of these we express the sincerest thanks and appreciation which comes from deep down in the collective hearts of everyone in the Class of 1921. May you all keep healthy and happy and keenly relish the anticipation of a repeat performance, with a firm resolution to make every effort to attend it.

Since these notes have had to be prepared in advance, a complete chronicle of the Reunion and our part in Alumni Day must await the appearance of the November issue of The Review, which opens the 1956-57 publication year. If this summer hiatus overburdens your desire for information on Classmates or whets your curiosity as to what went on and who is the new horseshoe pitching champion, a request to your Secretary will bring you all the news that's fit to print! To be certain that you will receive the next nine issues of The Review from November through July, be sure to send your contribution now to the 1957 Amity Fund, via the card enclosed with the recent fine letter from Squire Ed Farrand, our Class Agent. If you can't find the card, send in your gift anyway and make it as large as you can on this 35th Reunion year. You may designate its use for scholarships or medical sciences if you wish, or you may leave it undesignated. As you know, the issues of The Review go only to contributors to the Amity Fund.

While we're on the subject of our loyal and hard-working Class Agent, we must report on two splendid letters which Ed Farrand sent to Class President, Ray St. Laurent and to your Secretary. These and another, directed to Chick Kane'24 of the Amity Fund, are concerned mainly with Ed's endeavors to improve further his already superbly handled responsibilities. We know that you, who have contributed so regularly and so generously for such a long period of time, will join in this public expression of sincere thanks to Ed for what he is accomplishing year after year in stimulating increased annual giving of the Class. Ed says that your gift each year expresses your thanks well enough for him and he is deeply grateful for the handsome response he has received. Our overwhelming regret is that Ed was unable to make the trip north for the Reunion and bring along Mrs. Farrand and son David, who is the famous fisherman of our 20th Reunion. Ed owns and operates Farrand Farms, Colonial Plantation, Leesburg, Ga., a cattle ranch, when he isn't carrying on the duties of the executive vicepresident of the Leesburg Chamber of Commerce or serving the Lee County Farm Bureau, of which he has been president for three years. He is also music director of the Leesburg Baptist Church. The former general manager and secretary of the United Conveyor Corporation, Chicago, Ill., Ed has been an Honorary Secretary of M.I.T. since 1934 and the 1921 Class Agent for some ten years. A 32d degree Mason and charter member of the Richard C. Maclaurin Lodge at M.I.T., he is a former president and secretary of the M.I.T. Club of Chicago and former manager of Chicago's North Side Polo Club. David was graduated from the New Mexico Military Institute. Best wishes from all of us, Ed.

Writing from his home at 9 Oberlin Street, Maplewood, N.J., Maxwell K. Burckett says he regrets his enforced absence from the Reunion and continues: "I am what is known as 'confined to quarters.' The last day I was in the office was February 15. I spent 25 days in East Orange General Hospital, getting out of bed for only a half-hour a day in the last week there. While I am not the celebrity that Dwight Eisenhower and Lyndon Johnson are, I am rated as being 'very lucky,' which is the only thing I have in common with them. Examinations and cardiograms are being made regularly to determine future action. For the moment, the schedule will not permit traveling to the office until the first of June, but my work is such that lots of it can be done at home and they even let me do some when I was flat on my back after the first week at the hospital. I am sorry I am not going to be at Pine Orchard to see so many of you guys. On the list of probable attenders, released as of February 22, I checked off the following names of those I would like to see and am asking that you give them word of my thoughts for them: George Chutter, Larry Conant, Chick Kurth, Moose LeFevre, Ray St. Laurent, Josh Crosby, Harry Field, Warrie

Norton, Munnie Hawes, Sumner Hayward

and Fred Rowell." We talked with Max and Ethel on receipt of his letter and are glad to report that he is most cheerful and getting along very well. They are preparing for daughter Gail's wedding this summer. Long before this reaches the printed page, we hope that Max will be back in full time direction of his work in packaging development and production for the International Division of Vick Chemical Company, New York City.

William R. Matthews of that first Course VI-A group, heads his own company, W. R. Matthews and Associates, consulting engineers and manufacturers representatives of Spokane, Wash. Bill is active in the local Chamber of Commerce and as a member of the American Society of Tool Engineers. He and Mrs. Matthews have five children: Ruth, aged 15; Margaret, 13; Marjorie, 10; William, 9; and Jane, 7. Bill says he occasionally sees Ted Rose and Cookie Cake. Donald W. Randolph, President of Structural Fibers, Inc., of Bedford, Ohio, and a director of the Master Pneumatic Tool Company, is active in the Society of Automotive Engineers and the Institute of Aeronautical Sciences. Daughter Helen is married and has two daughters. Edward W. Noyes, Sr., who lives in Macungie, Pa., is sales engineer for the Chicago Pneumatic Tool Company in Wynnewood, Pa. Ed, Jr., who attended Penn State, Isabelle, who went to Marywood, and Thomas are married and Willard, a graduate of Penn State, now attends the Philadelphia College of Osteopathy. The Noyes have seven grandchildren.

Romney J. Mellen is chief metallurgist in charge of milling operations for the Mexican Mining Department of the American Smelting and Refining Company in El Paso, Texas. He reports that Adin A. Brown'20, who was general manager of the department, has been promoted to vice-president. A member of the American Institute of Mining and Metallurgical Engineers, he has written a number of technical papers and has several patents to his credit. He and Mrs. Mellen have two married daughters, Barbara, who attended the University of Colorado, and Eleanor, who went to Denver University.

versity.

Mrs. Irving Whitehouse, the former Helen Cleveland Lord, Course VII, writes from her home in Cleveland, Ohio, and says, in part: "Your questionnaires always make me feel facetious, but I have resisted the temptation to tell you I am still employed by the same 'firm,' etc.! However, I am still married to the same man I met in Course II (Irving Whitehouse '22). My five youngsters are grown up. Only my youngest son, Tom, is still at school, with another year to go. He will graduate next year in Course II at M.I.T. My only daughter, who by the way, is married to Louis B. Baldwin, Jr., '48, just presented us with our tenth grandchild, who is named for me. I no longer have a lap dog, cow, or any ditto goats or even chickens or ducks. Just a gay little poodle, who tolerates my inactivity. Reading, driving and a little gardening are enough to consume my energy and I like being lazy! I enjoy reading Class news. Thanks for your efforts." James R. Cudworth is dean of the College of Engineering,

School of Mines, University of Alabama, where he has been since 1923. Jim's son, Allen, M.I.T.'52, is on the staff of the Institute's Lincoln Laboratories in Lexington, Mass. His older son, James, Jr., attended Duke and the University of Alabama. Jim is a member of the American Institute of Mining and Metallurgical Engineers, the American Society for Engineering Education, the Mining and Metallurgical Society of America, Newcomen Society, Sigma Xi, Tau Beta Pi, Delta Epsilon Phi, and the University and Cosmos Clubs of Washington, D. C.

You have received the excellent letter from our Class President, Raymond A. St. Laurent, with up to date news of the participation of many of our Classmates in M.I.T. affairs as well as the special assignments being carried out by your Class officers and committee chairmen. Ray has sparked every one of these many activities himself and is deserving of the highest plaudits for his ever-friendly and helpful administration of Class affairs. Busy as he is, there seems to be no limit to his refreshing new views on how to foster the interests of Classmates and M.I.T. and his inspiring will to get these things done. We'll probably be drawn and quartered for putting this in print, but since his letters always modestly omit his own contributions and emphasize the accomplishments of everyone else, it is most necessary to set the record straight and point out that we have a Class Presidents' President, who prefers to stay behind the scenes but who really is the whole works. No amount of praise or appreciation that could be put into words would adequately measure up to what we all owe Ray for the job he has been doing for the Class of 1921 ever since our graduation. Sure, you can write a note of thanks; address him at home at 47 Gerard Street, Manchester, Conn., or in care of Rogers Corporation, Rogers, Conn., creators and fabricators of unique fibrous and plastic materials known as "Fiberloys." The Dean's List for the fall term of 1955 at M.I.T. carries the names of Peter C. Card'57 and Malcolm M. Jones'57. Peter is the son of Tom and Mrs. Card of Fairhaven, Mass., and Malcolm is the son of Mrs. Jones and the late S. Murray Jones. Congratulations!

Thomas B. Card has recently returned to his Fairhaven, Mass., home from a sojourn in Argentina on location for his engineering firm of Parsons, Brinckerhoff, Hogan and Macdonald. Robert C. Cook has migrated north to Canandaigua, N.Y., from his winter home in Ft. Lauderdale, Fla. James L. Entwistle, President of the James L. Entwistle Company, reports his new business address as 761 Park Avenue, Cranston, R.I. G. Whittier Spaulding, Vice-president of the Pennsylvania Power and Light Company, says his new home address is 3402 Highland Street, Allentown, Pa. Harold F. Stose now lives at 76 Walnut Street, Natick, Mass. David P. Wheatland has moved from Cambridge to Topsfield, Mass. Rev. Dr. Williston Wirt has taken up his new pastorate at the Pearl Harbor Community Church, C Avenue and Second Street, Honolulu 18, Hawaii. New addresses have also been received for John M. Gundry, Jr., Brigadier General Henry Hutchings, Jr., Walter A. Jayme, Andrew D. Maclachlan, Walter A. McKim, Alan L. Morse, Major General James B. Newman, Jr., Kenneth H. Pratt, Howard L. Ross, Edward G. Sparrow, Lyall L. Stuart, Francis T. Whitworth and Harding DeC. Williams. "Five Areas for Management Reappraisal," is the title of an article relating to views of unions, government, security, taxes and tariffs, by Saul M. Silverstein, which appeared in the March 1956, issue of Dun's Review and Modern Industry, published by Dun and Bradstreet Publications Corporation, New York City.

.It is with deepest sorrow that we record the sudden passing on March 13, 1956, of Colonel Herman Henry Pohl, United States Army, Retired, at his home in Watch Hill, R. I. Colonel Pohl was attached to the office of the Chief of Engineers, Corps of Engineers, Washington, D. C., before his retirement. He was graduated with us in Course I. He is survived by his wife, to whom we extend sincerest sympathy on behalf of the entire Class.

This July issue closes the current volume of The Review and we pause until the November issue once more calls the clan to assemble and resume our monthly sessions in these columns. Meanwhile, to you and yours from all of your Class officers and committeemen go best wishes for a very pleasant summer.—CAROLE A. CLARKE, Secretary, Federal Telephone and Radio Company, 100 Kingsland Road, Clifton, N. J.

· 1922 ·

Alumni Association President, Theodore T. Miller has left Boston and The Dewey and Almy Chemical Company for New York where he is president of Polymer Chemicals Division, W. R. Grace and Company, 3 Hanover Square, New York. Ted's home address is 178½ East 64th Street, New York.

Clif Gayley has left New York and its environs to live in Lookout Mountain,

George B. Allen is Manager of Sales of The Mason-Neilan Regulator Company, which has recently built a large new plant at Norwood, Mass.

Further information about the 1957 35th Reunion will be sent direct by the committee to all interested Classmates from time to time. From information received to date it appears that our 35th will be very well attended. — C. YARDLEY CHITTICK, Secretary, 41 Tremont Street, Boston, Mass. WHITWORTH FERGUSON, Assistant Secretary, 333 Ellicott Street, Buffalo, N. Y.

• 1923 •

That was a nice picture of Julius A. Stratton VI in the May 7th issue of *Life*. The article describing student work at the Institute and the approach President Killian is making towards high quality scientists was most refreshing. I trust all of you read it with pride.

Eger V. Murphree, V, Assistant Secretary to Defense Secretary Charles E. Wilson, has been named to direct and coordinate the guided missile activities of the Defense Department where he will be responsible for research, development, engineering and production, with major

emphasis upon long-range ballistic weapons. Murphree has been president of Esso Research and Engineering Company since 1947. During World War II he was a member of the Office of Scientific Research and Development and helped set up the Manhattan Project. Earlier, he was chairman of the Planning Board that made it possible to secure raw materials and pilot plants for the early stages of A-bomb development. Congratulations, and the best of success!

Archibald Williams, XIII, Vice-president of the American Hardware Corporation presented, "Management's View of the Function of Organized Labor in Our Economy," before a meeting of the Worcester Chapter, Society for the Advancement of Management. Milton E. Parker, VII, on leave from the Institute is president of the Sea Products Corporation at Fall River, Mass. He told the city councilors that Fall River can become to the fishing industry what Chicago has been to the meat packing industry, provided they recognize that modern technology now knows how to control fish and other odors.

Joseph L. Hetzel, VII, was named to the newly formed Planning and Zoning Commission at Middlebury, Conn. After leaving the Institute, he graduated from the Yale University School of Medicine in 1926 and is presently attending pediatrician on the staff of the Waterbury, Conn., Hospital. He is a member of the American Medical Association, the American Academy of Pediatrics, the Connecticut State Medical Society, the Waterbury Medical Society and the State Advisory Council on School Health.

Harland C. Forbes, II, of Con Edison has been named along with President Killian to be a member of the "Watchdog Group" to make periodic checks of the government's foreign intelligent activities. That job will require quite a lot of watching.

Reports from Bond in Boston, Coleman in Chicago and Zimmerman in New York reveal all situations under control. Reports and information for these notes will be appreciated from all sections of the country. — Howard F. Russell, Secretary, Improved Risk Mutuals, 15 North Broadway, White Plains, N.Y. Wentworth T. Howland, Assistant Secretary, 1771 Washington Street, Auburndale 66, Mass.

• 1924

This is our swan song for the year, the academic year, that is. Some of you have already started on your summer vacations. Matter of fact some of you, Ray Lehrer, for example, haven't been back too long from your winter vacations. He returned from Florida late in April. Frank Barrett also had a late winter vacation this year, although not one he'd planned. A stay in the hospital plus a bit of recuperation at home. At present writing he's on the mend, says the cardiograms are almost back to normal.

We told you some time back that Webster B. Brockelman had entered the political arena. His efforts were crowned with success. With a margin of 1,500 votes over his Democratic opponent, Web became a selectman of the town of Framingham, Mass. At long last a wanderer has re-

turned to the fold. It took H. Royce Greatwood a bit longer to get his degree than he'd planned, and as a consequence through the years he has been carried on the alumni rolls as a member of the Class of 1925. He has just now taken appropriate steps, and as of last May, Royce is now a bona fide '24 man again. Retired to a lemon grove in Santa Barbara, farmer Greatwood is not finding the lemon business the easiest possible way to make a fast buck. Matter of fact, he says so far it has proved to be an excellent way to get a good writeoff for income tax. If you want to put Royce in your directory, it's Hope Ranch Park, 777 Via Hierba, Santa Barbara, Calif.

After a few years of shuttling around the country with Union Carbide and Carbon, Walter J. Bagby finally landed in their plant in Whiting, Ind. That was twenty odd years ago. Now he is plant superintendent. In March, just before leaving on a Guatemalan jaunt with Mrs. Bagby, Walter attended an M.I.T. Club meeting in Chicago at the Bismarck. And here's an item in his letter that just goes to show how valuable that Class Directory of ours can be if it is used. After the meeting the Bagby's went to Cinerama as the guests of the president of the Bismarck Hotel Company, "Otto Eitel, M.I.T. about 1928, I think." If Walter had looked in the directory he would have found Otto's name just seven pages after his own! Got the lowdown on Paul Keppler's latest. A letter from Mrs. Keppler says that Paul left for Korea in January. He will be there until July of next year installing a new steam power station in Masan for Bechtel Corporation. When he gets it built, he has to stay around a while to teach the Koreans how to operate it. While Paul is seeing one part of the world Mrs. Keppler is doing this country. She is in New Orleans now, plans to come north this fall before returning to California to await his return.

Ray Hamilton seems to have shifted his base of operation. At least we have a new address for him in Tonawanda, N.Y. Still with Linde Air Products, of course. Next week, as this is written, a little group of serious thinkers are getting together at the M.I.T. Faculty Club. On the evening's bill of entertainment, the writing of persuasive or nasty letters, as indicated, to those refugees from he Alumni Fund. Under the able whiplashing of Class Agent Frank Shaw, Messrs. Ambach, Lehrer, Cutting, Parker, Knight, Westman and your Secretary will assist in the last roundup. If our efforts are anywhere near as productive as they were last year it will be an evening well spent. In any event, we'll have fun.

With summer here and you fellows engaging in a lot of travelling, fishing, sailing and other forms of vigorous activities, don't forget to put your Secretary on the postcard mailing list. Come fall I hope to be able to give you a quick rundown on how a bunch of very young grandfathers occupy themselves in the hot months. — Henry B. Kane, Secretary, Room 1-272, M.I.T., Cambridge 39, Mass.

· 1925 •

Many of our Class have made the newspapers in the last couple of months and much of the news coming back to the Institute is good. James C. Evans, civilian assistant to Assistant Secretary of Defense Carter L. Burgess, received a \$300 award and a citation from the Defense Department at a special ceremony at the Pentagon last February 15. Presenting the award, the citation read as follows: "Mr. Evans' outstanding ability, vision and perception — his tact and graciousness — have been of immeasurable value in the development of an effective manpower and personnel program for the Department of Defense." More specifically, Mr. Evans was cited for his outstanding contribution to the Department in the field of racial relations.

Also in the news is Commander Henry G. Brousseau, U.S.N.R., who has recently been appointed commanding officer of the Naval Reserve Surface Battalion 1-1, Boston. This battalion is composed of naval reserve surface divisions totalling more than 700 officers and enlisted personnel. Commander Brousseau has been associated with the naval reserve since 1941. During World War II, he was commanding officer of the U.S.S. Samuel S. Miles, a destroyer escort, in the Pacific. He participated in the battles of the Marshalls, Marianas, Philippines, Iwo Jima, Pelileu and Okinawa. While under his command, the Miles was responsible for sinking a Japanese submarine in the Palau area.

From the Stamford, Conn., Advocate comes an item stating that James Smith McDonnell, Jr., President of the McDonnell Aircraft Corporation of St. Louis, was married on April 1 at Alexandria, Va., to Mrs. Priscilla Brush Forney, a graduate of Vassar College.

Calvin Campbell has sent in an item from the Harvard Law School Bulletin which should be of interest to many of the Class. He has been general counsel of the Dow Chemical Company since 1940, having come to the company in 1935, after seven years with the legal staff of General Motors Corporation. In 1948, he was named a Dow Director, he became Secretary in 1949, and vice-president in 1950. His office is in Midland, Mich. Mr. Campbell, who has an intimate knowledge of the operation of his company and the chemical industry in general, graduated with a B.S. degree in chemical engineering from the University of Michigan in 1924, and also received a degree in engineering administration from M.I.T. in 1925, prior to his entrance at the Harvard Law School. He is a member of the American Institute of Chemical Engineers, the New York Academy of Sciences, the American Bar Association, and the State Bar of Michigan.

On a serious note, the Hartford, Conn. papers of March 30, 1956, carried news of the death of James S. Woodward. Jim was born at Bridgewater, Vt., and had lived in West Hartford, Conn., for the past 10 years. He was employed as an engineer by the Chandler-Evans division of the Pratt and Whitney Company, in West Hartford. He was a member of the Westminster Church of West Hartford, Presbyterian, and had been active in the men's club. He was also a member of the Hartford Engineer's Club and the American Institute of Electrical Engineers and the M.I.T. Club of Hartford. He is survived by his mother, his wife and two daughters.

Nice words regarding Ed Kussmaul's Reunion Report still come in by telephone and by letter. If you have not received a copy but would like one, just let the Secretary know.

The Secretary spent a most pleasant evening with Irving M. Symonds of New York City a few weeks ago. Sy's 20-odd years in Mexico have not changed him in the least. Any of you who are in the New York area should give him a call at the offices of the American Metal Company, Ltd., 61 Broadway.

For those of you in the Chicago area, be on the look-out for Karl R. Van Tassel. After many years with the General Electric Company at Schenectady, Karl left that company on April 23 to become executive vice-president of the A. B. Dick Company in Chicago. — F. L. FOSTER, Secretary, Room 5-105 M.I.T., Cambridge, Mass.

1926

These notes have started time and again with some comment about the sound of the waves down below the cliff. This morning I hear them again but the roll and splash has a different cadence. Also as I look out to sea, instead of a manmade granite breakwater a long low coral reef is performing the same function. This issue of Class Notes is being written from a location in Bermuda that so parallels our location at Pigeon Cove that it is almost uncanny. Our cottage here is the same distance up from the water and the same distance back. Before leaving for this holiday I tossed what Class Notes material there was into the suitcase and there it has remained until this morning, our eighth and last sunny day here. Rising early as usual finds me with an hour to wait before the grl brings breakfast down over the hill so what better way to ward off semi-starvation than to get going on the notes.

Just before we left Boston, a form came from Alumni office telling of the death of one of our few coed Classmates, Mary Soroka. It was reported by a friend of hers with no details. I haven't the Alumni Register here but believe she worked as an engineer in the Air Force at the Pentagon in Washington.

Here is a nice letter from faithful correspondent Win Russell who is still in Formosa with J. G. White Engineering Company. He reports seeing Classmates H. Y. Lo and M. C. Chu now and then on the island. Win expresses regret at not being able to attend our 30th Reunion and we regret that he will not be there -I really should say - was not there, because the July notes will be published after Reunion. We were also happy to have a note from Prince Warner regarding the Reunion location. Having changed his residence three times in two years, the Reunion mail was not catching up with him - so that Prince's friends will know where to locate him we will give you his current address: 50 Popham Road, Apt. B-2, Scarsdale, N.Y. Well, at this moment the aroma of bacon and eggs is taking my mind off this effort. After breakfast a trip into Hamilton before jamming the suitcases closed for the flight home. The magic carpet now has us back in Boston - it's only a three hour flight.

Upon arriving home Malcolm McNeil a member of the Reunion committee phoned about the final meeting and he also tossed a real big surprise at us. While we were on vacation, class agent "Pink" Salmon changed his business affiliation. After 20 years with the Merchants National Bank of Boston "Pink" has gone back into manufacturing and from vicepresident of the Merchants he becomes vice-president of D. S. Kennedy and Company of Cohasset, Mass. This company manufactures radar antennas and associated equipment and have produced the largest antennas in existence. The founder of the company, Don Kennedy, gained his technical education in the school of hard knocks but by strange coincidence your Secretary went to high school with him many years ago in Waltham. We feel that each friend is now in very good hands and we extend felicitations to "Pink" in his new venture.

A letter just arrived from Jay Goldberg expressing regrets that he will not be at the Reunion. He is leaving for a quick business trip to England and will not be back in time for our 30th. Jay is consultant to the textile industry with offices in New York but the demand for him as a speaker before technical groups seems to carry him everywhere, i.e., back to Europe in the fall to talk in Sweden.

Our next issue of the notes will be in the fall and it will be devoted to the 30th Reunion. Meanwhile we will be expecting to hear from Classmates who come to New England during the summer. At least please give us a ring and if you hit Cape Ann drop by, Ruth says I'm always out sailing whenever a Classmate comes to Pigeon Cove but try it anyhow – we always keep a special cache of beer for '26 men to consume from our collection of M.I.T. steins. Hope to see you! Also to everyone - a most pleasant summer. -GEORGE WARREN SMITH, Secretary, E. I. du Pont de Nemours and Company, Inc., Elastomers Division, Room 325, 140 Federal Street, Boston 10, Mass.

1927

The Alumni Association in reworking the Alumni Register have furnished us with the information that there are 805 living members of our Class and 82 deceased. Fourteen names have been dropped, due to our having had no word from them in 10 years, and their having attended one year or less.

Jim Lyles has been made a member of the executive committee of The First Boston Corporation. This comes just in time to help him marry off his two daughters in rapid succession, one in June and one

in September.

Art Connell, Vice-president of E. B. Badger and Sons Company of Boston, has just returned from a trip to England and the Continent on petroleum refining equipment business. He tried to contact some of our expatriot Classmates over there but without success. Incidentally Art very strongly favors Oyster Harbors for our 30th Reunion. - J. S. Harris, Secretary, Shell Oil Company, 50 West 50th Street, New York 20, N. Y.

· 1928 ·

Early in May, Ralph Jope, in talking with Bill Kirk, learned that Bill's son, George, had been accepted into M.I.T.'s Freshman class and will begin his studies this fall. We are very pleased to add George Kirk's name to the growing list of '28 sons and daughters who have enrolled at the Institute.

Walter (Andy) Anderson, who graduated in Course XV, has been kind enough to bring us up to date on his activities. He is with Simplex Wire and Cable Company in Cambridge, Mass., where he heads up the physical testing laboratory. Outside of business, Andy is kept occupied with his new ranch-style home in Needham (5 Border Road) and with Boy Scout committee work. Daughter Judith is married and has a two-year-old son. Andy's own son, Warren, now 13, is in junior high school. Andy helped on the 25-Year Reunion Committee and is anxious to get going on the next big get-together.

Bob Kales wrote to Ralph Jope recently and had the following to report: "As you probably know, I have been an active member of the Naval Reserve at the Naval Air Station, Grosse Ile, Mich., for a number of years, and, in addition, I have taken considerable interest in the Military Order of the World Wars, which is an organization made up of officers of all branches of the service who have served in either the first or second World Wars or the Korean fracas. I have just completed considerable work and effort in cooperating with the Michigan military district in promoting Military Reserve Week here in Detroit; in addition, I have been representing the Military Order of the World Wars in preparations for Armed Forces Day Week, which is the week from May 14-20. Things of this kind take up a large amount of time but somebody must do them, and I find it both interesting and instructive." George I. Chatfield, Secretary, 49 Eton Road, Larchmont, N.Y. WALTER J. SMITH, Assistant Secretary, 15 Acorn Park, Cambridge, Mass.

1932 •

We are winding up this year's Review campaign with a world of news. Much appreciation from your Secretary to all of you who have given me bits of interest about yourselves, and also to my helpful assistant secretaries, Rolf Eliassen and Bill Barker.

First, the expected good news that Carroll Wilson has been made president of Metals and Controls Corporation of Attleboro, Mass., with whom he has been general manager for the past few years. This is a very interesting company, one of the leading manufacturers in specialty metal parts for general control on electronic applications. Carroll let me have a copy of his last year's very informative annual report, and I am sure he would be glad to send one to anyone who is interested.

Dick Morgan is a lieutenant colonel in the Army serving as executive officer of the 2d Engineer Construction Group in Korea. He is a veteran of over 15 years of Army service. A few months ago he was in the news for presenting a gift of \$525 in band equipment and instruments to the Long Life Orphanage in Yongdungpo, Korea. Dick was in Course II at M.I.T.

U)

After a few years as plant manager of Flex-Let, Alex Daunis has joined the growing number of our Class in business for themselves. He is a partner in the Jewel Case Corporation of Providence. As you might guess it has to do with the design and manufacture of fancy jewelry boxes. Still has the same five children previously reported. His daughter, Cecil is a chip off the old block and may be a prospect for M.I.T. She was awarded a second grant in the Junior Science Fair of Rhode Island, which is a real honor. Only last September she returned from a visit of a year spent with her aunt, an Army nurse in Japan.

George Colby is back in business for himself with the Magnetic Seal Corporation. It has to do with a new principle of high pressure seal which is undergoing research and which shows great potential. George lives in Barrington, R.I.

A few weeks ago, Bill Barker stopped while driving through Essex, Conn., and spent a few minutes chatting with Freeman Fraim at his plant, the Essex Mills. Daughter Ianis is a Sophomore at Jackson, and Freeman, III is a Junior at Loomis School and there is a good possibility, Free says, he might head for M.I.T. Essex Mills are still working closely with Chemstrand Corporation on the manufacture of nylon artificial arteries. Bill Barker says they also make swell expandable belts because Free made him a present of one. Free was recently made a director of the Connecticut Manufacturer's Association and at the last annual meeting of this association he was happily surprised to find that Carroll Wilson was the speaker. Free hopes to be at the 25th with his wife and possibly some of his children.

Bruce G. Eaton, Jr., former technical director in the Office of Naval Research, has been appointed Senior Advisory Engineer for the Westinghouse Electric Corporation, Air Arm Division. Bruce has been associated with the aviation industry since he received his master's degree with our Class. His first position was with the Curtiss-Wright Corporation, whose Airplane Division he joined in 1932 as senior project engineer for military aircraft. Later he was appointed chief design engineer of pilotless aircraft. In 1949 he joined the Naval Air Development Center, Johnsville, Pa., as associate director of the Pilotless Aircraft Development Laboratory. He went with the Office of Naval Research in 1951. Bruce is an associate fellow of the Institute of Aeronautical Sciences and holds several patents on aircraft and missiles.

A letter from Dick Marcus: "I know that you have not heard from me for ages but I would like to give you the following information. First of all, I have every intention of attending our 25th Reunion and I am looking forward to meeting some of my old Classmates whom I have not seen since leaving school. I was married in 1936 and have three children. The oldest, my son, is 18 and is attending M.I.T. as a Freshman. I have two daughters, one who will be 14 next month and the other will be 11 in June. Since leaving school, I have been working in the rubber business, being connected with the American Biltrite Rubber Company. We have a plant in Chelsea, Mass., as well as Stoughton, Mass., and we also operate plants in Trenton, N.J. and Sherbrooke, Quebec, Canada. We manufacture rubber heels, soles, and rubber and vinyl flooring. Recently, our company has acquired controlling interest in the Boston Woven Hose Company, which keeps me pretty busy there. It was nice meeting a few of our Alumni who are working for the Boston Woven Hose Company. The president, Mr. Bierer, was in the Class of 1910 and the comptroller, Bert Webster, in the Class of 1933. In working so close to M.I.T., I am afforded the opportunity of eating at the Faculty Club where I meet some of my old teachers and buddies at the school. I trust that everything is going along well with you and that we have a bang-up turnout at the 25th Reunion."

Ralph Patch, X-A, is now in Germany, address Nonenstieg 18, Hamburg 13, as advisor to the manufacturer of the refinery run by the Esso A.G. From his card I quote: "Have been here on my new assignment since early February and may be here for several years. Left job as head of the petroleum products division at the Esso Refinery in Baton Rouge. Hamburg is an interesting city of 1,750,000 people, quite industrial, with shipyards, three oil refineries, vegetable oil processing plants, flour mills, and so on, and a big shipping center as well with a large free port established in 1189. People are very friendly and hard-working, very tolerant of my attempts to speak their language, and often speaking English very well. Looking forward, enthusiastically, to my work

Two cards from Classmates in the Philippines. First, Bernardo Abrera, General Manager of the National Shipyards and Steel Corporation in Manila: "Since graduation made one visit to Tech in 1950, and met Professor Owen and Professor Butner. Trip around the world for Philippine government business-observation and studies shipbuilding and iron and steel plants. Constructed new shipyard with graving dock 10,000, first to be built in Philippines. Also new steel plant with latest modern equipment for production of steel bars and shapes. Various government international committees - Chairman, Reparations Technical Mission to Japan, 1947-1949, and Philippine Delegate to Economic Commission of Asia and the Far East (ECAFE). Four children since graduation – yachting and playing golf, handicap 20." Also, from Francisco Santana, 12 Alcalde Jose Street, Pasig, Rizal, P.I.: "I am running a small bakery, have two tug boats towing logs for plywood factory, have a small sand and gravel dredge, developing a mango and other fruit farm of my own, with a few cows and chickens, and growing also some flowers and other vegetables, and enjoying mostly this farm life. I went to the M.I.T. Alumni Reunion in June 1952 but met none of my Classmates in the graduate class. I was at one time Dean of the Institute of Technology of the Far Eastern University, but gave up teaching after the last war to concentrate on the small business of my own. I have an only daughter now 17 whom I hope to send abroad after her graduation."

Herman Protze owns his own business — H. G. Protze, Materials Technologist — consulting on construction materials including testing and development. Herman is handling such jobs as the Karl Taylor Compton Labs at M.I.T. and the National Shrine in Washington, D.C. He has three children, a daughter in B.U., a boy in high school and a girl 12. He reports: "Am putting on too much weight; have no ulcers but am ready for a nervous breakdown in spite of a wonderful wife."

Dave Lionberger, Jr. is a maintenance engineer for Tennessee Eastman at Kingsport, Tenn. He has one son graduating from high school who was captain of the basketball team, and two younger boys

still in grade school.

Don Freeman, engineer in the Ammonia Division of Shell Chemical, San Francisco, reports that he spent most of the winter in a body cast after having some bone grafting work done on his backbone. He is doing well, however, and expects a busy season as drillmaster for his boys' drill team — second place in the California championships last year and potentially first now.

Henry Phillips is the principal designing engineer for the water bureau of the Metropolitan District in Hartford. His friendly card reads, "Wonderful family (2 boys, 2 girls, 1 wife); interesting job; and so busy I can't feel old age creeping up yet. Boy at Hillyer College; girl at Grace-New Haven School of Nursing. Water Bureau building a new dam on west branch of Farmington River. Comfortable country living and the world looks good. Best regards to you and the

Charlie McCormack reports in from 204 South Road, Lindamere, Wilmington 3, Del. A technical sales assignment with Du Pont for neoprene and other elastomers keeps him very busy. He writes: "Since leaving M.I.T., worked eight years for O'Sullivan Rubber Company at Winchester, Va. Have been with Du Pont for past 15 years, working mostly with neoprene in various capacities. Just returned from a two-month European trip visiting wire and cable people in 11 countries. Married 17 years. Have three girls (15, 11 and 9), and one boy (12 years). My wife hailed from Brooklyn (Eleanor Mc-Caughan)."

Rolf Morral, whom we have reported as head of the x-ray diffraction section in metallurgical research at Kaiser Aluminum, has joined the Battelle Memorial Institute in Columbus as consultant in the Metallurgical Engineering Division. His new address is 505 King Avenue., Columbus.

Harry Krutter is now chief scientist of the Naval Air Development Center in Johnsville, Pa. He was promoted to this position at the start of the year. Previously he had been technical director of the Aeronautical Electronics and Electrical Laboratory at this Center. Harry pleads traitorous to the M.I.T. tradition by attending the 27th session of the Advanced Management Program at Harvard Business School, but "P.S. I enjoyed it."

Mrs. Hildred Robertson Pierce writes that her husband will retire this November from the Marine Corps. The Pierces are planning now to return East even though they found California a wonderful place to live.

A cryptic card from Stan Rudnick, 660 Clermont Street, Denver 20: "It's a long way from M.I.T. to garbage disposers." Stan is regional sales manager for the Given Manufacturing Company, which I take it makes garbage disposers.

Two of our Classmates who have become clergymen report in. Winthrop Robinson is pastor of the Lake Harriet Baptist Church in Minneapolis. He writes, "The God of the atom is greater than His creation and has prior claim on us all. Let this be basic in our philosophy!" Robert Lawson has just been installed as minister of the Wollaston Unitarian Church.

Roy Haeusler is automotive safety engineer for the Chrysler Corporation in Detroit. John Ruggles is Assistant Divisional Comptroller for the Inland Manufacturing Division of G.M.C. in Dayton. Izzy Kalikow is section manager of Engineering, Aircraft Accessory Turbine Department, General Electric, Lynn, Mass. Philip Mayo is manager of Government Contracts for the American Optical Company at Keene, N.H. And Kenneth Thompson is chief chemist of the Western Division, Basic Refractories, Inc., at Gabbs, Nevada.

News of two deaths: Allen Talcott died suddenly this winter en route home to Connecticut from Aspen, Colorado. Allen had been president of Sis Chemicals, Inc. in Stamford. Besides his mother, he leaves his wife, Mrs. Shirley Whitney Talcott, a son, Whitney Agnew, and a daughter, Priscilla Stearns. John Gustafson died in a fall in his home after suffering a dizzy spell. During World War II John was an Air Corps Captain. He left his wife, the former Mildred Olson, and three sons. Our sympathies go to both these families. - ROBERT B. SEMPLE, Secretary, Box 111, Wyandotte, Mich. Assistant Secretaries: WILLIAM H. BARKER, 45 Meredith Drive, Cranston, R.I., Rolf ELIASSEN, Room 1-138, M.I.T., Cambridge, Mass.

1933

Your assistant secretary was beginning to despair because very little news flowed in. But recently there has been a literal flood to which we are indeed grateful. Top honors this month go to Walt Duncan, President of Bornot, Inc. of Philadelphia. Walt and his family, including three children, were written up extensively in the January issue of The Rotarian. Specifically, the objective was to show readers in 93 lands what life is like in a city of the United States. With characteristic modesty, Walt demurred at the personal publicity involved but it is clear that the editors made a fine selection in that every member of the family is photogenic. We are indebted to Bob Smith for sending in this story. Bob recently became assistant manager of Chemical Equipment Sales for Pfaulder Company. He reports that Walt Swanton is also with Pfaulder currently working in Mexico on a new plant. John Wiley, director of aviation for the Port of New York Authority, recently participated in a round table discussion on aeronautical problems with several leaders of aircraft companies. Warren Henderson reported recently from his farm in Exeter. N.H. Warren spends some of his time in the Cleveland area and also makes a regular trek to Florida. Pete duPont met recently with the Institute's Visiing Committee on Student Activity and otherwise continues to show an active interest in M.I.T. affairs. We are indebted to Cal Mohr for sending clippings from the Chicago papers reporting on Pete's recent speech at the annual meeting of the Immigrants' Protective League. Pete is chairman of the committee for the proposed American Museum of Immigration to be built at the foot of the Statue of Liberty to honor the foreign born who have helped to make America great

helped to make America great. Our congratulations to John Sbrega, who is chairman of the science department at Holyoke High School, for winning a Shell Merit Fellowship for study this summer at Cornell University. John previously held a similar fellowship from General Electric and has received public recognition for his effective leadership work on behalf of science and mathematics in secondary schools. Congratulations also to Robert T. Gammons, a member of the firm Roberts, Cushman and Grover in Boston, for passing the Massachusetts Bar Exams. Bob who is married and the father of three children, lives in Natick. We regret to announce the passing of William L. Bell who died on March 19 in Washington. Bill had a distinguished career with the Army. I had occasion to see him and work with him several times in New Mexico on the atomic energy project. Bill is survived by his wife and two daughters. Guido Garbarino who is assistant director of Westinghouse International looks as young as ever. He reports modestly on the doings of his family which includes eight children, the Class record and probably the Alumni record, as far as we know. "Garb" spent two months late this spring in Europe. Bob Winters, man of distinction for the Class, who serves as minister of public works and right-hand man to the Premier of Canada, returned to the campus this spring to speak on the contributions to society made by the students who work part time during the school year. Bob is a valued member of the Institute's Visiting Committee for Geology and Geophysics. Best wishes to Harris Thompson who has set up his own business in Boulder, Colo., manufacturing electrical equipment. Harris was formerly with the University of Colorado. Congratulations also go to Robert C. Moeller, Jr., who has succeeded his father as president and treasurer of the Collyer Insulated Wire Company in Pawtucket. Bill Wadt has become assistant to the president of the Enjay Company. Formerly, Bill was superintendent of Esso's Bayonne Refinery. We are happy to hear that Rolly Glenn has been made assistant works manager of all the Carbide chemical plants. -George Henning, Secretary, 330 Belmont Avenue, Brooklyn 7, N.Y. R. M. KIMBALL, Assistant Secretary, Room 3-234, M.I.T., Cambridge, Mass.

· 1934 ·

Last month, you will remember, we ran a letter from John Hrones who is in Europe on a leave of absence for six months with his family. We have another one, dated March 16, and written from Greece and Istanbul, which we quote as follows: "When we landed in Pireaus on February 21, the two landmarks which would dominate the environs for the next three weeks could be clearly seen with the aid of field glasses. These were the Parthenon and the white monastery on top of Lykavittos.

"On Wednesday, with Chris Theophanopoulas as our guide, we went to the Acropolis and spent some hours taking in the Parthenon, the Temple of Nike, the Erestheum, and Odion of Heroditus, Attica, the Theatre of Dionyseus, and so forth. We returned to this site several times, the last three times under the guidance of professors at the American Institute for Classical Studies. One is struck by the beauty of the structures and impressed by the enormousness of the undertaking in terms of the times in which it was undertaken, or for that matter in terms of any period of time. The unanimous vote of the Hrones family is that nothing that we have since seen comes close to matching it. I expect that one should really visit Athens last. Otherwise, the structures at other spots suffer by comparison. We considered the visits to Corinth, Eleusis, Sounion, and Paestum very worth-while, but the vision of the sunlit Parthenon dimmed their lustre. The first day at the Acropolis was somewhat colored at least for the children by the dive some unhappy male took from the wall. He was hauled up with block and tackle as Chris was expounding on the glories of ancient Greece.

"Another day we drove to Sounion some 50 miles south of Athens, where the Temple of Poseidon is perched on a hill by the sea. The seashore is beautiful, and all in all it was one of the loveliest days we spent in Greece. Some weeks later returning by Swissair from Istanbul, the pilot found this view imposing enough to circle low over the Temple as we came into Athens. Perhaps the most impressive part of the trip was the contrast it provided between urban Greece as represented by Athens and rural Greece. Athens is a great metropolis with buses and streetcars and taxis rushing around. People mill around the streets and pay no attention to an auto until you actually nudge their clothing with a fender. Even in March many people sit in outside cafés discussing politics at all times of the day. The city is crowded and is becoming more so as refugees continue to come in from Turkey and other bounding coun-

"In spite of the obvious difficulties and differences, Athens is very much urban in character. The majority of people are neatly dressed in western attire. Telephones are available everywhere, although I soon learned that it is impossible to do business by phone. You must talk and talk and try to get things written down. After being accustomed to having a competent, beautiful secretary get me reservations to Washington on an hour's notice, the arranging of even the simplest kind of travel absorbs a surprising amount of time and energy, I discovered.

"Television has not as yet been added to the ruins of Greece, but radio, blaring out what is reported to be Greek music is common. Trucks are the mode of shipment although some donkey carts can be seen in the center of the city. However, once one leaves the city proper headed south (really any direction except the populous suburbs) the scene quickly changes. Early in the morning as we headed out the road was lined with peasant families going out from the villages to work the fields. They travelled in small groups, by foot, by donkey, and the very plush by cart. Their clothes, possessions, and dwellings indicated a standard of living far below that of Athens. The fields which they worked were some of the more fertile in Greece. We saw many oranges and lemons. There were thousands of olive trees, not yet bearing their seasonal

"Frequently we passed through small villages where the peasants live in small houses grouped together on both sides of a narrow street. The women carry water in large jugs from a central supply. The standard of living is obviously at a low level but perhaps in some respects better than in some sections of Athens. We reached a small beach at Sounion at noon where in a tiny restaurant we selected fish from a batch just caught and watched the preparation of the meal over an open fire. On our way back we passed workers, often with their families, returning from the fields. Most of them had their donkeys and themselves loaded with brush and the trimmings from the olive trees which they use for fuel.

"On Sunday we started out early in the morning on the long narrow winding road that leads through the mountains to Delphi. At about the halfway mark John, Jr. took sick, and we decided to turn back. Early Tuesday morning a doctor and surgeon called in a hurry, strongly recommended an immediate operation for appendicitis. At noon John was operated on in the Areterion Hospital, a unit of the University of Athens. The surgeon spoke French and Greek, the nurses only Greek. However, Peg was given a bed in John's room and remained with him until he came out six days later.

"I was scheduled to leave for Istanbul on Tuesday night but telegraphed a post-ponement when we heard the doctor's story on Tuesday morning. I found out later that my telegram was received in Istanbul on Thursday evening. This is apparently par for the course in this part of the world.

"Mixed in with daily visits to the hospital, the rest of us took in a number of the museums in Athens; visited ancient Corinth; ate in a variety of Greek restaurants often going for pastry dessert to Zonar's, a treat we all went in for in a big way.

"I gave two lectures at the Technical University of Athens on two evenings at 7:00 p.m. Abstracts in the Greek language were distributed, and I spoke slowly to permit the students who are studying English to practice on me. Nick Theophanopoulos served as interpreter in addition. I spent a considerable amount of time visiting laboratories and discussing education with various members of the staff. This material is being written up separately.

"While the sun shone every day save one while we were in Athens, the political clouds hung dark with no letup of the verbal and newspaper discussions of the Cyprus situation. The feeling against the British was running high. Many of the Greeks (of course) were anxious to have the U.S. take a stand in favor of Greece. The presence of the Turkish minority on Cyprus combined with the September 6 riots against the Greeks in Istanbul and the long standing hatred of the Turks and Greeks for one another all contributed to a certain tenseness in the air. In addition, the apparently growing feeling here that war will break out between Egypt and Israel this summer really makes this spot an anxious one.

"Such was the picture when I flew on British European Airlines to Istanbul on March 8. The plane was delayed some two hours in getting off the ground with strong rumors flying that the plane was being carefully searched. We landed at midnight at the Istanbul Airport where Nehmet Ozdas and a friend met me and drove me the long distance to Robert College where I was put up in a very comfortable apartment in Collins House. During the next few days I lived as a member of the Ballantine family. Peggy and Duncan did everything to make my stay a pleasant and profitable one save arranging for suitable weather. It was cold with snow and rain most of the time, the kind of weather one expects in Boston in March.

"Friday I visited the National Technical University with Ray Pearson, now associate dean of engineering at Robert College. He is a former graduate student at M.I.T. and did a thesis under me in 1947 and 1948. Ozdas showed us around the laboratories, and we met the dean and many professors. On Monday and Tuesday evenings at 5:30 P.M. I lectured at the National Technical University with Ozdas as interpreter. He did an excellent job and after the first ten minutes we were able to dovetail English and Turkish with considerable smoothness. On Tuesday I visited laboratories at Robert College and talked with many of their staff. I also spoke for an hour to an assembly of Juniors and Seniors. There were also long discussions with Duncan Ballantine, who is president of Robert College, concerning the many problems which face him. He is very much pleased with the results of Harold Hazen's six-week visit. Harold's report is being much relied upon in laying plans for the future. I also took part in a staff meeting for the engineering school. I am skipping over the story on engineering education in Turkey as that will be covered separately.

"One cannot come to Istanbul and spend all one's time within university walls as the larger walls of the city contain much of unusual interest. The hour and a half flight from Athens to Istanbul takes one from the West to where the West and the East meet. Recognizing the influence of the East, the degree of Westernization accomplished by the Turks under Ataturk in a quarter of a century is remarkable. Western dress is worn almost exclusively. With essentially no exception our alphabet is used. Those who go on to high positions in education do graduate work in the U.S., in France, in England, and in Germany. The German is by far

the strongest, and I sense a recent push from Germany to enhance this tie further. The extremely difficult financial position which Turkey is now in makes it extremely difficult to get dollars out of the country. Until this situation improves I would expect relatively few Turkish students to come to the U.S. Symbolic of the Western influence is the new Istanbul Hilton Hotel. Here in the most modern luxurious surroundings one meets international visitors and the wealthy Turks. Turkish women, expensively dressed, (no veils) could easily pass unnoticed at the Waldorf-Astoria. As I had to take an early plane on Wednesday morning, I spent Tuesday night at the Hilton, A really lovely room, beautifully furnished and overlooking the Bosphorus, cost 40 lira. If one exchanged dollars in Greece for lira at the rate of 10 lira per dollar, the cost of the room was low - \$4.00. However, if one earned his lira in Turkey where the official exchange rate is 2.7 to the dollar, the room is expensive - \$16.00.

"The above situation leads to an active black market in dollars which operates quite openly. One would be well advised to carry as many dollars in as needed (not travelers checks). This difficult currency situation results from the fact that Turkey is close to bankruptcy. For the size population Turkey has the largest army of any country. In its desire to develop prime sources of power it has undertaken simultaneously the building of several large scale hydro-electric plants involving in each instance major dam construction. This combined with a leadership, many I talked with questioned the wisdom of, has led to a serious financial crisis. The importation of all products is rigidly controlled, and one sees few foreign products in the stores.

"The University, with a sizable budget (on paper) for equipment, cannot purchase foreign instruments and since none are made in Turkey is faced with a shortage of the kind of equipment that is essential to top notch research work. However, there is more to this story than lack of instruments.

"It is clear that Turkey must pull its belt in tight, it must produce products that can be exported, and it must have substantial aid from the U.S. American business men whom I talked with in Istanbul think that Turkey can meet and solve its problem. They are not sure it will.

"Turkey has coal and mineral deposits. It can produce a surplus of food. Some American companies are now drilling for oil. The material aspects of the problem appear solvable. However, only a small percentage of the population is educated through high school. The Turks also have a great tendency to get around problems rather than to solve them. Nevertheless the feeling among thinking people in Istanbul is that given real leadership, Turkey can make the grade. It is important to us that they do for they play a strong right end for us against Russia. They have been bitter enemies of the Russians for hundreds of years and do not use the soft pedal in their relations with them. One cannot detect a trace of communism

"Ozdas and Peggy Ballantine rendered noble service in showing me the sights in the short time we had. Included were visits to St. Sophia, the Blue Mosque, the Bazaar, and the underground Cisterns. Most of them in the snow and rain.

"On Sunday evening the Ballantines had an interesting group of Americans in for dinner. Most of them had been working in Turkey for some time and represented the Squibb Drug Company, Pan-American Airways, the State Department, General Electric, and so forth. Their impressions of the situation in Turkey were of great interest. In addition, Mr. and Mrs. Davis attended (Mr. Davis is a trustee of the Grant Foundation). They had just arrived from Athens on the Oslo Fjord after spending Saturday in Athens. Their description of the demonstrations in Athens on Saturday morning were far from quieting.

"I had heard, of course, radio accounts of the British action concerning Bishop Makarios on Friday and realized that it could lead to serious disturbances in Greece. Frankly, I had difficulty in believing the news for it appeared to me a stupid, blundering move that the British would be too smart to commit. While the feelings regarding the British action differ in Athens and Istanbul, the opinion in both cities is that the move will gain nothing and may cost the British a good deal.

"I reasoned that my family would stay in Kifissia, some seven miles outside the center of the city, and that the Theophanopouloses would see to it that they did. Nevertheless I tried to place a phone call through to Athens but was informed that there were 'technical difficulties.' Finally, on Tuesday morning the American Consul got through on a poor connection to Peg in Athens. In the meantime the Consul was advising all Americans to avoid Athens for the time being. I changed my return flight from British European Airlines to Swissair and arrived in Athens early Wednesday morning. The city was quiet with soldiers present at every corner.

"When I arrived in Kifissia I discovered that the whole family plus Chris Theophanopoulos had gone shopping of all things in Athens on the previous Saturday morning, had been right in the middle of the demonstration, ate lunch there while a rock came through the window of the restaurant. However, everything worked out all right, and everyone has much to talk about.

"The following day with the help of the Theophanopouloses we sailed from Athens on the Miaoulis to Brindisi, Italy. We had run into many things we had not planned, and the political situation was building up in intensity to a point where we were glad to leave." — Walter Mc-Kay, Secretary, Room 33-211, M.I.T., Cambridge, Mass.

· 1936 ·

With all the news that has come from Classmates, there is more than enough to give us all a glimpse of what everyone is doing. About 85 Class members were good enough to send back postcards, or even wrote letters—all of which makes for a more interesting column.

The thing that is most interesting is the number of Class members who, since the end of World War II, have started out on their own and formed their own businesses as in consulting engineering, spray nozzles, radio parts, exporting, ice cream, optics, and so on. Everyone who has seems to face all the problems that can be imagined, but wouldn't trade it for going back "to work" under any circumstances. A fair number of the Class have risen in their respective companies to become vice-presidents - how many vicepresidents in each company is not known. Then, too, a number have taken up totally different professions - a few lawyers, several doctors, quite a number of teachers, a fair number of Army, Navy and Air Force men, and even a few ministers - to add a leavening whole. Most of the rest of us are, however, still working hard somewhere in the upper middle stretches of business to make our contribution to

Victor Lopez, XII, writes from Caracas, Venezuela, where he is "Geologo - Ingeniero de Minas" to comment on his activities. At present Victor is on the Executive Board and the Engineering Staff of the following companies: Cementos Coro S.A., Logomar C.A., Construcciones Ferroviarias C.A., Ralca C. A. Cementos Coro is building a cement plant of 500 metric tons daily capacity in the port of Chichiriviche. The project was one of Victor's studies from its geological studies to its complete engineering realization. Plant cost is estimated at \$10,000,000. Logomar and Ralca are dedicated to city development and are at present working on two large projects for the city of Caracas, and Construcciones Ferroviarias is working on the dam site for the Caroni Electrification project, a large government project for the electrification of the Caroni River and Orinoco River. Besides all this, Victor has found time to write 20 articles on different phases of Venezuelan geology, dam projects, and other equally impressive things. All Classmates going to Venezuela will be well advised to look up Victor.

Taichiro Hori, VI, writes from 2219 Ookayama Meguroku, Tokyo, Japan, where he is the Foreign Trade Division of Tokyo Shibaura Electric Company Ltd. As he puts it, he is "Trying my best to export heavy electric machineries to South Asiatic countries and South America." In the course of his travels he has visited all of the South Asiatic countries. (Not, however, finding many M.I.T. '36 men!)

Steffen Holmblad, XV, writes from Odinsa, Denmark, to say that he is still managing director of H. Rasmussen and Company, an iron foundry with about 500 employees. Steffen's firm has a record, however, that few can equal. On May 13, 1956, the firm celebrated its 100th anniversary.

Nearer at home, an announcement is made that Irvin Etchells (Course X) has taken over as assistant works manager of Hercules Powder Company's Port Ewen, N.Y. plant, manufacturing electric blasting caps, delay blasting caps, squibs, ignitors, and special detonators for civilian and military use. Irvin has been with Hercules since he joined as a chemist with Hercules' Experiment Station at Wilmington, Delaware, in 1936.

Word comes of the work of Walter Seinsheimer, VIII, as secretary-treasurer of the Technical and Scientific Societies Council of Cincinnati, Ohio. The council is comprised of the Engineering Society of Cincinnati and 23 local sections of national societies, whose aim is to maintain high professional standards in their respective fields. The council was founded in October 1935, to co-ordinate activities of the organized technical and scientific groups in the Cincinnati area. In addition to this, Walter still carries on his managing consultant work as partner in his Sernsheimer and Associates firm.

The news includes a report of Dorie Shainin's, Course XVI, activities in helping conduct a symposium of eight lectures on "Thinking Tools for Today's Engineer" at M.I.T., under the auspices of the Boston Section of the American Society for Quality Control. The tools Dorie talks about are tools for accurately determining customer requirements, for speeding up research and development, for smoother launching of new designs, and so on. The brochure says Dorie is widely known as an author and teacher in the field - this in addition to Dorie's work as Chief Engineer with Rath and Strong, Industrial Consultants, Boston.

Bernard Vonnegut, V, now Dr. Bernard Vonnegut, who is now a research associate with Arthur D. Little, Inc., Cambridge, Mass., has come up with a hunch that lightning causes tornadoes. The curiosity of the scientist has been prodding Barney ever since, in Scituate, in 1953, he took pictures of lightning playing in the clouds as the 1953 tornado went out to sea. This was no ordinary lightning. "I never saw anything like it," Barney said. "It was incessant. There were 10 to 20 flashes per second. Most of it was inside the clouds: but occasionally a shaft of lightning would strike through." This is what impressed him and set him out to track down his theory: there was more electrical energy in that display of lightning than in all the power stations in the United States - an amount of energy that certainly would be enough to make a tornado with speeds in the spinning cone up to 500 miles per hour. In order to get such winds, high temperature is needed. Thus, tornadoes are common in large forest fires and may be caused by the high temperatures created by the flames. Some people think that tornadoes cause lightning. Barney turns this around to say that lightning may cause tornadoes.

Dick Koegler, XVI, takes a moment off from his work - among other things, as assistant editor of technical societies news of the Niagara Frontier, the official publication of the Technical Societies Council of the Niagara Frontier - in order to answer an inquiring reporter's question: "Is automation due to bring big layoffs?" Dick's logical answer to this was: "No. Automation is really a further refinement of mass production and, like it, will make a much more widespread distribution of goods possible through further price reductions. The increased volume, plus additional jobs in distribution, the design construction and maintenance of the automation equipment and plants will more than offset the reduction in the number of workers required to produce a single unit.

Consider the plight of countries like France who have not improved their production efficiency. Also consider the answer to the old question, 'Think of the buggy whip manufacturers that the automobile put out of work.'

Lee Tolman, IX, writes from Albuquerque, New Mexico, to say that after some assorted knocking around he is on active duty, assigned to the Armed Forces Special Weapons Project with a present rank of lieutenant colonel CE (USAR). Home address: 132 Perimeter Drive SE, Albuquerque, New Mexico.

Donald Henshaw, VI-A, writes from Pawtucket, R.I., to say that he now operates a small sheet-metal business in Pawtucket — The Crowell-Henshaw Sheet Metal Company, fabricating, heating, ventilating, and air conditioning equipment. He is active in R.I. Citizens Association for Public Schools of which he is president, and in Pawtucket Civic Council for Education.

Ted Mitropoulos, VI, writes from Cambridge, Mass., to say that he is now head of the Electrical Laboratory at Simplex Wire and Cable Company, Cambridge. His work consists of measuring the electrical properties of wires and cables, DC and AC up to 400 Mc/s, at voltages up to 750,000 volts AC and 500,000 volts DC.

Bill Hull, XVI, writes from Redondo Beach, Calif., near Los Angeles, reporting that he now has his Ph.D., in Psychology and is establishing a practice in Clinical Psychology with his office in Redondo Beach, Calif. "It is slow building, but progressing nicely. Fascinating work."

Perhaps, from here on, some of the messages can speak for themselves:

Bill Orrison, I, of San Antonio, Texas, says: "My wife's name is Mary Elizabeth and we have three children. Boy — W. Gresham (13); girls — Mary P. (10) and Ann D. (5). At the present time the firm I am with, Southwest Leases, Inc., is constructing buildings in many sections of Texas and we do a lot of travelling mostly in our Cesna 170 which I am learning to fly."

Ed Cahill, X, now writes as Rev. Edward A. Cahill, from his vantage point as minister of Unitarian Church of Charlotte, N.C. Ed is director of the Department of World Churches of the American Unitarian Association, and in this capacity has been attending international conferences of religious liberals as delegate of the association for the past eight years. Ed has also been actively concerned with the founding of the Albert Schweitzer College in Churwalden, Switzerland.

Word comes of the appointment of Bill Reilly, III, to the newly created post of assistant to the president of H. M. Sawyer and Son Company, Boston, Mass., manufacturers of protective clothing, rainwear and coated fabrics. Previous to this appointment, Bill was vice-president of the industrial engineering firm of J. Saliba and Associates, Cambridge, Mass. For the past 15 years he has been a consulting industrial and management engineer and has worked extensively with the U.S. Armed Forces.

Leo Kramer, II, reports in to say that he has just completed 10 years with Raytheon Manufacturing Company, in the

extremely active growth of the electronics industry. Leo has the position of department manager in Raytheon's Equipment Engineering Division at Wayland, Mass., worrying about such things as design drafting, engineering shops, purchasing, material control, and publications activities. This keeps him quite busy, but he does have time occasionally to check in with some of Raytheon's other '36 Class members employed by the company, such as Bryant Fowler, Ed Dashefsky, Harry Pekin and Harry Brown.

Al Dasburg, VI, drops a line from Rochester, N.Y., to say that he is currently in the engineering department of General Railway Signal Company, as manager, yard and terminal development. Al's principal activity is the application of automation to railroad freight operations in U.S., Canada and Mexico. His family consists of wife Matilda, and daughters Diana (14), Deborah (12) and Daphne (10) (none presently inclined toward M.I.T.!)

Webster Wilson, XV, says he has been living out in the wilds of Little Neck, Long Island, N.Y., since getting out of the Navy (Lt. Cmdr.) in '46. Webster is now vice-president of Hazeltine Electronics Corporation, and "working my fool head off." Webster is married and has two daughters, 10 and 13. As Webster says: "I don't see many of the gang from '36 but do run across a few fellows now and then from the good old Deke House."

Donald Brown, II, gives us a pinpoint Horatio Alger story of his life to date: "Financial enforced leave from M.I.T. 1933; Common laborer 1933-34; Entered U.S. Naval Academy 1934, graduated 1938. Duties have involved cruisers, destroyers, and attack transport, but mostly submarines. Most important and wise decision in life was to marry Rosalie Ely of Rutherford, N.J.; results have been three boys and a girl. Submariners are supposed to have nothing but girls and I was almost disqualified for my errors. Now in fleet maintenance division of the Office of the Chief of Naval Operations - for my money the best outfit in the Pentagon.

Bernard Sturgis, V, tells us that he was recently appointed director of the Du Pont Petroleum Laboratory located at Deepwater, N.J. In January he was presented the Horning Memorial Award of the Society of Automotive Engineers at their annual meeting in Detroit for the best paper on the relationship of fuels and engines for the year 1954. Bernie is married and has two children - Jane and Richard. Bernie was the original chairman of the committee charged with the founding of the Combustion Institute, and is now officer and member of its board of directors.

Pete Peterson, VI, says he is not in engineering work now, having forsaken his electrical engineering training for financial matters, and is now manager finance for the power tube department at General Electric. As Pete says: "Two boys, 9 and 12, keep me busy in Scouts and Cubs; the girl, 3, hasn't yet started to join any organizations." Pete also reports that he met Norm Willcox who has just been transferred from Bloomfield to Schenectady, also with G. E.

Word comes that Bill Kennedy, XVI, was recently promoted from project sales

engineer on the electra at Lockheed Aircraft Corporation, to assistant managersales engineering. Bill lives in Pasadena, on a hillside house overlooking the Rose Bowl, with his wife Bea and three children Robert, Deanie and Taffy. Bill and Bea are active in their community, Linda Vista - especially in Boy Scouts and Community Chest work. They also enjoy weekend sailing in their penquin dinghy at Balboa Yacht Club where Bill is fleet captain of the penguin fleet.

Charlie Betts, XVII, writes from Scotia, N.Y. (near Schenectady): "Four daughters keep me running like mad to keep ahead of them; at least one of them is a potential engineeress. Wife stays out of the hub-bub by teaching school. Part owner of Hanson Construction Corporation, in Schenectady, N.Y., - general construction of commercial buildings, churches, and schools. Handle the engineering, estimating, and purchasing aspects of the business.

Walt MacAdam, VI, writes from White Plains, N.Y., that in 1953 he had the job heading engineering on first portion of distant early warning radar line in Arctic with Western Electric (DEW line). Walt was then chief engineer for eastern area long lines department of A.T. and T. until March 1956, when he went back to A.T. and T. headquarters at 195 Broadway as transmission engineer where he is working on application of new transmission systems. Walt was married in 1941 and has six children, two boys, four girls.

That seems to be enough for the time being and news from the 60 remaining cards will have to await the fall issues of The Review. Before closing, however, it is reported that among the other members of the Class of 1936 whose addresses are unknown are: Chiu, Yau L.; Court, Newton H.; Johnstone, Ernest A.; Scheftleman, Eugene H.; Smith, David M.; Wise, Dominic P. Anyone knowing the whereabouts of any of these former Classmates is asked to send a postcard to me. HENRY F. LIPPITT, 2ND, Secretary, 30 Rockefeller Plaza, New York 20, N.Y.

1938

At anytime that two or more of you '38 men meet for lunch or dinner, think of the rest of the Class: scribble a note on the back of the place mat and ship it off to your Class Secretary. I'll do my best to interpret it, and another item for the notes will be generated. Lou Bruneau got a gang together recently and they were thoughtful enough to let me know. Among those present were Harry Saunders (in the group's opinion A.T. and T.'s expert on color TV), Ty Shen, Paul DesJardins, Fred Ray (who knows every gas octane rating by heart), Henry Sieradski (producing for Lockheed), and Ed Hadley (producing for Hadley and the greater glory of M.I.T.). Charlie King also attended and wrote the following note: "Just moved our office uptown to 3rd Avenue at 44th Street. It's supposed to be the avenue of Manhattan eventually, but is kind of a wilderness of old loft buildings right now. Just bought a new Ford Thunderbird to sport around in before old age sets in. Still travelling back and forth to Europe. Just returned last weekend from second trip this year."

From Dick Muther we have the announcement that "Richard Muther and Associates, Consultants in Industrial Management, take pleasure in announcing our new services for industry, management planning and controls; policy and organization studies; new-product and production planning and control; plant layout; material handling; facilities modernization; cost reduction; methods engineering; time standards; training and procedures; job evaluation; manpower utilization; supervisory development. The organization is located at 701 East 63rd Street, Kansas City, Mo."

4

Roy Hopgood reports, "Life is so active from day-to-day, no matter how you look at it. My patent law practice has never been so full, civic activities are terribly demanding, the house needs major maintenance, and four active kids keep us hopping."

We understand that J. J. Phillips has a

new son - born April 25.

Finally a brief news item: Ralph Van Sant'36 recently spoke before the Boston Section of the American Society of Lubrication Engineers. His topic was the manufacture of lubricating oils. Except for a period of service in the Navy he has been with the Gulf Oil Corporation since leaving the Institute. - DAVID E. ACKER, Secretary, Arthur D. Little, Inc., 30 Memorial Drive, Cambridge, Mass.

1940 •

Phil Stoddard has recently been appointed assistant treasurer of the Institute. Phil has successively risen to this esteemed position at M.I.T., having been most recently acting director of the Industrial Liaison office.

Your Assistant Secretary had a most welcome visit in late April from David

("Beano") Goodman.

'Beano" is now owner of the Madison Chemical Company of Madison, Ind. One of the interesting sidelights of "Beano's" career is the short time he put in in "pro" wrestling. "Beano," you may recall, was on the varsity team and after college he wrestled professionally (at 275 pounds) as "Mad Carlos," working against such stellar performers as "Rasputin," and so on. He is now down to 230 pounds.

George Dienes, who was with us for one year, and whose wife, Peggy, is also in the Class of '40, is co-author of the book Nuclear Fuels. George is a topnotch physicist with the Brookhaven National Laboratory. - ALVIN GUTTAG, Secretary, Cushman, Darby and Cushman, American Security Building, Washington 5, D.C. SAMUEL A. GOLDBLITH, Assistant Secretary, Room 16-325, M.I.T., Cambridge, Mass. Marshall D. McCuen, Assistant Secretary, 4968 West 14th Street, Indianapolis, Ind.

1941

Because of the necessary lead time for preparing, printing, and distributing The Review, this is being written prior to the 15th Reunion at Plymouth. Join us in the November issue for details!

Bob Bailey writes: "After wandering around South America and Long Island since leaving M.I.T., I've finally settled down as a weather coordinator for Eastern Air Lines at Atlanta. We have an Argentine daughter and a Long Island daughter!" Thanks, Bob, how about hearing from some others of you?—The opening of the Radio Corporation of America advanced development laboratory in Needham, Mass., has been announced. In it, RCA's previous work on ferrites will be continued and expanded, under the direction of Francis E. Vinal, who received his doctorate in Chemistry in 1941, and who was associated with the M.I.T. Lincoln Laboratories before joining RCA.

And so we close another year, editorially speaking. Have a good summer, all of you. Write a letter, send a card, or dispatch a carrier pigeon; but, however you do it, let's hear from you!—Ivor W. Collins, Secretary, 28 Sherman Road, Wakefield, Mass.

· 1942 ·

HEAR YE! HEAR YE! Plans are now being made for our 15th Reunion. Jerry Coe has appointed George Schwartz as general reunion chairman and investigations are already being made by Stan Golembe for a suitable and big enough resort hotel. A committee is in the process of formation for what promises to be another grand quintennial get-together. As plans become crystallized they will be reported in this column and, of course, will be circulated in general mailings by the committee's publicity group. We were fortunate at our 10th in having some very nice prizes donated by Class members firms. It is not too early to start gathering such material, so, if you should prefer to have the items stored in the Boston area, please send them either to George Schwartz, Doelcam Division (Minneapolis Honeywell Company), 1400 Soldiers Field Road, Boston (George is vice-president and general manager); or send them to me at the address below.

By way of good fellowship and gettogethers, Harvey Kram reports that a sprinkling of men in the New York area met on April 16 at the M.I.T. Club of New York. Their party was a howling success. The program included cocktails, dinner, and a long bull session, and those present were: Munroe Brown, Francis Card, Steve Farrington, Jack Flipse, Elliot Friedman, Bob Greenes, Frank Herlihy, Carl Jealous, Alan Katzenstein, Harvey, Bob Kraus, Bernie Levere, Floyd Lyon, Dave Nichinson, Norman Pinto, and Bill Van Nostrand.

We recently received a letter from the Alumni Association reporting of their difficulties in maintaining up-to-date addresses for some Alumni. In particular they have not received acknowledgments of mail to the following five men: Walter C. Gabel, Zeit T. Wang, Fletcher W. Brown, Jr., George R. Clark, and Sheldon W. Kennedy. If any of the readers of this column know of their whereabouts, please drop me a postcard. Since they have not been heard from for ten years or more, the Alumni Association is inclined to regard them as not qualified to retain membership. If we manage to reestablish communication, I am sure the Association would be happy to adjust the situation.

The department of interesting statistics reports that our Class lists 1133 of the 47,210 living Alumni in the 1955 Alumni Register. We note with sorrow the passing

of 41 members of our Class. In terms of age distribution more than one third of the Alumni of the Institute are younger than we. (The median point is between the classes of 1937 and 1938.)

A news item from the *Item* of Spring-field, Mass., tells of the appointment of Charles R. Stempf as manager of the newly created standard products section of the Worthington Corporation's export department. The ballots in the Alumni Association election have been tallied and I note that I have been re-elected as council representative for a term of five years. Thank you for your votes.

We note with pride the promotion to flag rank of the first member of our Class. Rear Admiral Aniceto C. Santos took his S.M. with us in Naval Architecture and Marine Engineering. Should you be travelling to Brazil, his address is Ishikawajima do Brasil, Ave Presidente Antonio Carlos 607, Rio de Janeiro, Brazil. Also, recently promoted to Captain, U.S.C.G., is Harry E. Davis, Jr. He is currently commanding officer of the Conrier out of New York.

Several men, this month, have made transcontinental moves: William P. G. Chapin left Worcester, Mass., for San Francisco and the S. F. *Chronicle*; Maurice T. Ireland, Lieutenant Colonel, has arrived in Hagerstown, Md., from Seattle; and Robert K. Olsen has abandoned Boston for Los Alamos, N.M.

Bill Pease has moved back to Boston (Wellesley) after several years in Alexandria, Va. Hank Henderson prefers the heights - he has moved from Lookout Mountain, Tenn., to Hilltop Manor in Wilmington, Del. Also in a new location are: Robert G. Breckenridge to Rocky River, Ohio from Washington, D.C.; Lyonel T. Finizie to Levittown, Pa. from Bridgeport, Conn.; Bob McBride to Houston, Texas from Charlestown, W.Va. (that's a long trip even if it isn't from or to a coast); Bob Navin to Michigan City, Ind., from Birmingham, Mich.; and Carl O. Wood to West Hartford, Conn. from the Boston area.

Best wishes to one and all for a pleasantly warm and sunny summer with high garden yields and low golf scores, lots of tan and little burn, lots of fish, breezes for sailors, calm days for tennis players, and, above all, a good time. So long 'til fall. — Lou Rosenblum, Secretary, Photon, Inc., 58 Charles Street, Cambridge Mass.

1943

Your secretary has completed his first solicitation for news for these notes by sending out the last of over 450 postcards. The results weren't what I expected, as far as the volume of replies, but the quality made up for that. Witness this from Leo Duval's wife: "One man of Class one nine four three, who is busy, as busy can be, has not got the time to drop you a line, but his wife correspondent will be. In November we moved to Cleveland, hating to leave New England, but he got the mania to be back with Sylvania, engineer of this district is he. We've one girl in grade two, and one due at school; a boy to us was born last year, on a summer morn. So the Duvals are now five - and glad to be alive! Even in Cleveland!" Their address is 1219 Belle Avenue, Lakewood, Ohio.

In the new arrival department we are happy to announce the birth on April 8, 1956 of a second daughter, Suzanne Jean, to Mr. and Mrs. Bill Verrochi of Norwood, Mass. On May 6, 1956, Class President and Mrs. James F. Hoey, Jr., welcomed the arrival of their second daughter, Eleanor Frances.

Best wishes to all for a happy summer; if your travels take you through the beautiful Connecticut Valley, please call on us. Jackie and I would be delighted to receive visits from Classmates. — RICHARD M. FEINGOLD, Secretary, 49 Pearl Street, Hartford 3, Conn.

· 1945 ·

As you read these notes your thoughts will, undoubtedly, be on your vacation, your boat, your garden or your golf. No doubt mine will be, too. However, at the moment, your Secretary is "straining" in order to put forth a few items of truth. Those of you that know me well know my ability to prevaricate; please do not give me the opportunity — drop me a line telling us about you and yours in order that we may pass it on to others.

Prexy Dave Trageser's official letter just arrived and I know you all enjoyed reading it as much as I did. Please make those Class dues checks payable to M.I.T. Class of 1945 and forward them to either Dave or myself. Should any of you that did not attend our 10th Reunion desire Reunion photos let us know. Pictures do not lie; it is most amazing to see how your full haired, thin friends have reversed adjectives!

Fortunately, Dave Trageser and Bill "You can take a New Englander out of New England, but you cannot take New England out of a New Englander" McKay have recently given us the word so we do have a bit of news. Bill, of course, is back in greater Boston with American Air Filter selling in Massachusetts and Rhode Island — unit heater sales must have been great this past spring, Bill. Ray Pelley of Procter and Gamble fame recently moved into a new home in greater Cincinnati designed by none other than Ray himself. Rumor has it that Maxie and Truddie Ruehrmund are expecting their first heir this summer. Bill Meade returned this spring after six months in Los Angeles for Stone and Webster. He might possibly return to the West Coast if the company can convince Bill to leave Boston! Not too many '45 men attended the Mid-Winter Alumni Meeting but Prexy Dave, Bill McKay, Bill Meade, Tom McNamara, Bill Shuman, Dick McManus, and Tom Hewson were in attendance. In his Class letter, Dave mentioned Tom Hewson's new position; he failed to mention the arrival of number three, Theodore Stokes on January 18.

Other recent arrivals are Nancy Jean Carroll, October 21, 1955; and fourth child Robert David Shuman, November 30, 1955.

Dick McManus is still with General Electric in Lynn, while Tom McNamara spends his time at Datamatic Corporation in Newton, an electronics outfit owned jointly by Raytheon and Minneapolis-Honeywell.

Before wishing you all a pleasant and festive summer, possibly we should examine a few more Reunion questionnaires. Freida Omansky spent two years with the architectual firm of David J. Abrahams and Associates before her marriage to Dr. Felix Cohen of Waban, Mass. Now her time is spent as a housewife tending Stephen David, seven years, and Richard Jonathan, five years. You all knew that Jeptha H. Wade and Emily Vanderbilt were married before graduation in March 1945 but did you know that Iep received his law degree at the little old red brick school up the Charles - Yes, Jeptha is a practicing attorney with Kenway, Jenney, Witter, and Hildreth in Boston while the boss tends to William Garettson, four years, and Emily Love, two years, out in Bedford, Mass. Jim Hoaglund is secretary-treasurer of Carns-Hoaglund Sales Company — manufacturers representatives for heating and air conditioning equipment in Phoenix, Ariz. Jim married Mary Lamb in September 1946, and at last report had a son, eight years, and two daughters, seven and five, respectively. Curt Beck retains his singular rights as a senior chemical engineer in the research and development department of Cabot Carbon Company down in Pampa, Texas. Jim Barrabee, husband of Marcia Wolper and father of Lisa Jill, is in the manufacturing research section at International Harvester Company in Chicago. Jim primarily co-ordinates inspection and quality control between the various plants of the

Mary Sullivan Nesbeda reports that her duties as housewife and mother of Peter, Lisa and Gene keeps her busy day and night while, on the contrary Tom Doggett finds that his duties at Bethlehem's Fore River Yard in Quincy keeps him busy only days; we suspect, however, that Tom has a sail boat that occupies what spare time he might have. Ep Radner is assistant to the director of the geophysics research directorate at the U.S. Air Force Cambridge Research Center. At Reunion time Ep and his wife, Babette Solomon, were celebrating their fifth wedding anniversary. Leon Schindel also whiles his time away in Cambridge as a research engineer at the Naval Supersonic Lab. Leon and Beatrice Bernstein, married in January 1949, have two boys six and three. John Hertig, an engineer with Du Pont, has four children ranging

That's it for this year – see you in the fall. – C. H. Springer, Secretary, 420 Lexington Avenue, New York, N. Y.

in years from seven to two.

· 1947 ·

Norm Holland, Jim Phillips and I have recently been holding some preliminary discussions to plan for our 10th Reunion which comes off next year. By the time you read this, we should have a full committee appointed to take charge of the affair; and you will shortly be receiving the first publicity mailings. Norm, by the way, was recently promoted to assistant professor in the Department of English and History at the Institute; and Jim is still with the brokerage firm of Vance, Sanders and Company in Boston.

Our Classmates continue to forge ahead in their professional careers as company releases and newspaper reports announce. Herb Kay has been named manager catalyst development for Climax Molybdenum Company, in which capacity he will be responsible for the development of uses of molybdenum in corrosion inhibitors, intermetallic compounds and ceramics as well as in catalysts. Herb was with Pittsburgh Consolidation Coal Company for six years before joining Climax Molybdenum about a year ago. Lloyd McIntosh is now general manager of the High Voltage Engineering Corporation in Cambridge. Lloyd lives in Winchester with his wife and three children. The Providence Chamber of Commerce has appointed Bill Harper as a consultant to its staff in sales and marketing. Bill was formerly with Hapman Conveyors, Inc., of Kalamazoo, Mich., where he rose to the position of sales manager, before accepting his new appointment. Tom Warner has accepted an appointment to the faculty of New Haven College, where he is instructing in mathematics.

Classmates have also been expounding before groups large and small on their favorite subjects. Jack Rizika gave a talk before the University Club of Malden on the occasion of its 47th Annual Meeting. Jack's topic was "The Relative Vulnerability of the United States and Russia." Jack is currently employed with the Aircraft Accessory Division of the General Electric Company. Talking before the membership of the Unitarian-Universalist Church in Lawrence, Ed Bennett, on the faculty of the psychology department at Tufts University, chose as his topic, "Marriage Adjustment." He followed this lecture with a second titled, "Growing Old and Staying Happy." Alan McClennen, director of planning of the Massachusetts department of commerce, discussed urban redevelopment before a meeting of the Brockton Taxpayers Association, and again before the Holyoke Chamber of Commerce.

It would seem that the majority of us (self excepted) are well married and settled down, as the wedding announcements have reduced to a mere trickle. Only two this month. Bill McCurdy was wed to Virginia Marie Stagis of North Haven, Conn., and Parker Symmes married Jane Delano Russell of Newton. Last it is my sad duty to report the death of Malcolm S. McIlroy on March 4. Malcolm was a professor at Cornell University at the time of his passing. — CLAUDE W. BRENNER, Secretary, 1470 Beacon Street, Brookline, Mass.

· 1949 ·

Fred Blatt and Helen Kaplan were married in February in Newport, R.I. Fred is working with Siegmund Instrument Corporation in Braintree, Mass., doing mechanical engineering research. Bill Atkinson and his wife Lou report the arrival of a son William, III. Bill is working with Electric Boat Company in Groton, Conn., where he has recently assumed the role of professor in presenting a course in elementary nuclear physics for his fellow employees. Bruce Bailey is continuing his work with Northeast Electronics in New Hampshire, but is planning to set up his own electronic development shop in the near future.

Dr. Lawrence Bickford, Jr., who received his Ph.D. degree in physics from M.I.T. in '49 has recently been promoted to associate staff physicist in the physical research department of IBM's Research Laboratory in Poughkeepsie. Carl Clark is with National Air Lines in Hialeah, Fla. Bill Estes is currently working with Boeing Aircraft in Wichita, Kansas. Ron Greene has resigned as president and general manager and sold his interest in Aurora Auto Sales, Lincoln-Mercury dealer in Aurora, Ill. He'll now turn his energies to the real estate business.

Jan Hoegfeldt has recently been promoted to chief inspector of Haynes Stellite's Wrought Alloy Plant in Kokomo, Ind. A Stork-O-Gram from San Jose, Calif., informs us that Shirley and Chuck Holzwarth added a baby boy Gregory to their family on March 1. Bob Griggs is now the father of three daughters and is living in San Juan, Puerto Rico, where he is associated with McConnell, Valdes, and Kelley.

Ed Kerwin received his doctorate from M.I.T. last summer and has been busy travelling around the country in connection with his acoustical work. At a meeting of the Acoustical Society at State College, Pa., in June 1955, he presented a paper on "Noise Reduction in a Passenger Airplane" which discussed the Convair Liner 440. Ed has officially severed his studies at M.I.T. but last summer was on the faculty of their Noise Control Program.

Bob Krudener is working with the Shakespeare Company in Kalamazoo, Mich., and recently added a son James to his family. Charles Kroll and Helen Stout were married last January in New Brunswick, N.I., where Chuck is heading up the technical data department at Squibb's Institute. Carl Lindstrom and Dorcas Guest were married Jan. 21 in Boston. Carl has received his S.M. degree from M.I.T. and is working as a research engineer in the Walter Baker Division of General Foods Corporation. Al Owens has recently joined the Guided Missile Division of Hughes Aircraft. Al was formerly associated with the Viko Furniture Cor-

Bill Raich is now the father of five children. He recently finished his graduate work at the University of Nebraska and is now working with Dow Chemical in their Saran Polymerization Lab in Midland, Mich. Charlie Smith has been named assistant chief industrial engineer at Singer Manufacturing in Bridgeport, Conn. Charlie was formerly work simplification manager and also served as assistant manager of the assembly department and assistant to Singer's director of industrial relations. Charlie is married and has two children. Ed Thompson has recently been appointed to the post of an associate managing editor of McGraw-Hill's magazine Chemical Week. Ed worked with Magnolia Petroleum, Socony-Vacuum subsidiary, prior to going with McGraw-Hill in March 1954.

Several last minute items arrived in time for this issue of the '49 gazetteer. In a nice note Leonard Bezark informs us that a fall wedding is planned for Mary Jane Mayer and himself. Leonard is working with Profexray, Inc., manu-

facturers of medical x-ray equipment in Chicago. He recently had two paintings accepted in the controversial Chicago Artists' show at the Art Institute there and also was represented by two paintings in the "Exhibition Momentum" another annual show of Chicago artists.

A newsclip informs us that Tom Hilton is now Dr. Hilton having recently completed his work for a Ph.D. in education at Harvard. As part of his studies, Tom has devised a special psychological test which is concerned with "ego involvement" and measures the interest a person has in his job or social role. The test will be carried on as part of a teacher education research project which Tom has been directing. Tom lives with his wife and two children in Belmont, Mass.

John Wykes and Louise McCormick were married recently in Los Angeles. John is working as senior aerodynamics engineer with North American Aviation. Marvin Zimmerman and Inez Chase were married in April in Portland, Maine. Marv is working with Lincoln Laboratory in

Lexington, Mass.

Maybe you don't think you're news but you'll agree you like to keep up with the personal status quo of other '49 members. Well they want to know about you, too, so give us all a break. Best wishes for a pleasant summer. - O. Summers Hager-MAN, JR., Secretary, 740 Hand Avenue, Cincinnati 32, Ohio.

1951

This issue can be termed the concluding chapter of Volume One: The First Five Years After M.I.T. With your permission, I would like to review some of the highlights of events the Class of 1951 has experienced since June of 1951.

Five years ago the Class of 1951, some 800 strong, bid adieu to M.I.T. and marched forward to the future. As you will recall, the Korean War was quite hot at that point of time. Some '51 reservists were called to active duty before completing their studies and others immediately after graduation. Other '51 men headed for Wright-Patterson AFB to serve a two-year period of duty, and the Army and, of course, the U.S. Navy had many Classmates partaking in those functions. Jobs were plentiful and those of us who began our working career did not have a difficult time finding employment. (Of course, jobs were not as lush as they are today - they tell me the Class of 1956 is having a rough time deciding which one of many attractive offers they should take.)

Some of the Class felt the need for further study in graduate areas and began working for their master's and doctor's degrees. Some of us found work in and around the Boston-Cambridge area while others headed literally speaking for the four corners of the earth. South America, Japan, Europe, India, New Zealand, and, of course, the many states in America became the final part of home

addresses.

Along with the desire to establish careers, the Class began establishing themselves in their communities by participation in community affairs. Marriage notices came to be a great share of the news items in our Class Notes section.

To say it mildly, the ranks of the bachelors began to grow smaller quite rapidly. And the '51 men began their home owning careers and items like the care of lawns, do-it-yourself projects, suburban living had their effect on cutting down the number of leisure hours.

Families were established with one or more voting members. Sir Stork received frequent recognition in this column. I would hesitate to estimate the great number of potential Techmen in our '51 family but I feel sure that the Class of 1975 will have many budding geniuses.

For some of us, physical aspects as the receding hairline, the growing corporation, the wrinkled brow, and so on moved in to demand a share of recognition.

The Class of 1951 was a very mobile one. Changes of addresses by the hundreds were recorded. Some deserve the globe-trotter's award. The service was responsible for a lot of movement. And for some Classmates, a change of employment provided a chance to explore new living areas. For many, the M.I.T. area proved to be a large magnetic force and they came back after sampling life in the South, Mid-West, or over-seas assign-

Some had a rendezvous with destiny. Death reached out to tag them while they were in the process of establishing a career, raising a family, and becoming civic minded citizens.

Five years have passed by and the class of 1951 has just had its first fifth-year reunion. If the college years can be termed the formative ones, then the years just past can be termed the career years. Theory and experience has provided the balanced professional background. Today, '51 men hold responsible positions in business, education, and government. Some of our distaff members are now homemakers and mothers. Several are practicing physicians having decided to enter the field of medicine. A number are professors in various colleges and universities. Careers in the service have interested others. Business functions as sales, production, personnel, finance, research engineering have their share of '51 men. M.I.T. has attracted a number of them who are now either teaching or working in some of the research laboratories. On balance, we can say that Classmates are well represented in all facets of human endeavors.

During these five years, the Alumni and Class spirit has burned brightly. Interest in M.I.T. affairs and the activities of the Class of 1951 has continued to grow. We have gained a greater realization of the guiding spirit of Tech and its great progress towards higher standards of education.

In the Class of 1951 area, it has been my pleasure to serve you as Secretary-Treasurer for the past five years. Your response in letters and notes to me for the Class Notes have helped keep the news columns stimulating. Your response to the Class Dues has been excellent. Not only did these funds make the class solvent again, but they helped the Reunion, the general Class news dissemination, and the costs of holding general Class elections.

The long lead-time precludes a review

of the Reunion - these notes are being written in mid-May. I hope that all of you who were able to attend had an excellent time reviewing old times with the other '51 men. A detailed coverage of Reunion Activities will appear in the next issue of The Review.

And now Station SJM will sign off. My wife, Irene, and I want to thank you all for the fine encouragement you gave us. It has been a pleasure to serve you from this side of the typewriter. Best wishes and good luck to you all. A final note: your new Secretary will begin his term of office with the next issue. Please give him your support. - STAN MARCEWICZ, Secretary-Treasurer, c/o The Lorraine, Route 2, Highland, N. Y.

· 1953 ·

Right now I am in the midst of reviewing for final exams which will commence about two weeks, hence. In spite of the fact that there is little news to report, I wanted to get something in this last issue so as to leave my address with you over the summer.

Mark Schupack having recently returned from a tour of duty in Japan with the Air Force, I believe - has been awarded one of the Walter S. Barr fellowship awards of \$1000.00. Congratulations Mark! Mark will go back to school with an eye toward graduate work in economics.

One marriage to report, Henry Kloss and Miss Jacqueline Sweeney were married recently in Appleton Chapel here at Harvard. Jacqueline is a graduate of Radcliffe. Right now the Kloss's are on a Bermuda Cruise. After the wedding trip, Henry and Jacqueline will live in Cambridge.

And only one engagement to report; that of John Simmons to Miss Frances Landrey. Frances is a 1954 Smith College graduate, and is a technician at Harvard. John is at present a lieutenant in the Army, stationed in Maryland. They plan a summer wedding.

That's all that I have for this season's Class Notes column. Have a good summer, write when you can, I'll see you next fall. - VINSON W. BRONSON, JR., Secretary, 18 Mellen Street, Cambridge, Mass.

· 1956 ·

The time has come to add another column to the Class Notes. This first article will be a review of statistics to orient the Class in its new place in the Alumni world.

We are proud of the honor bestowed upon us by the recent article in Life magazine. We hope that we can live up to the prophesies made on our future.

This Class is not the largest in Institute history but at latest count there are 615 bachelors degree candidates, 358 masters and professional degree candidates, and 85 doctoral degree candidates for June graduation. September will add to this

No accurate figures are available on the immediate future of the Class but it is predicted that they will be similar to those of last year. These statistics, including all degrees, indicate that 47 per cent will enter civilian employment, 19 per cent will go on to graduate study, 15 per cent will enter the armed forces, 7 per cent will return to their native country, 4 per cent will enter government service,

and 8 per cent will not report.

Beginning with the next issue, the personal lives and fortunes of the Class of 1956 will be featured in the content of this article. I would appreciate any information on our Classmates in the form of letters, newspaper clippings, or company promotion lists.

I will be glad to prepare a list of Classmates that will be living in your part of the country or world if you will notify me. If you wish to find a fellow Classmate, be sure and get in touch with me. See you next issue. — BRUCE B. BREDEHOFT, Secretary, 1528 Dial Court, Springfield, Ill.

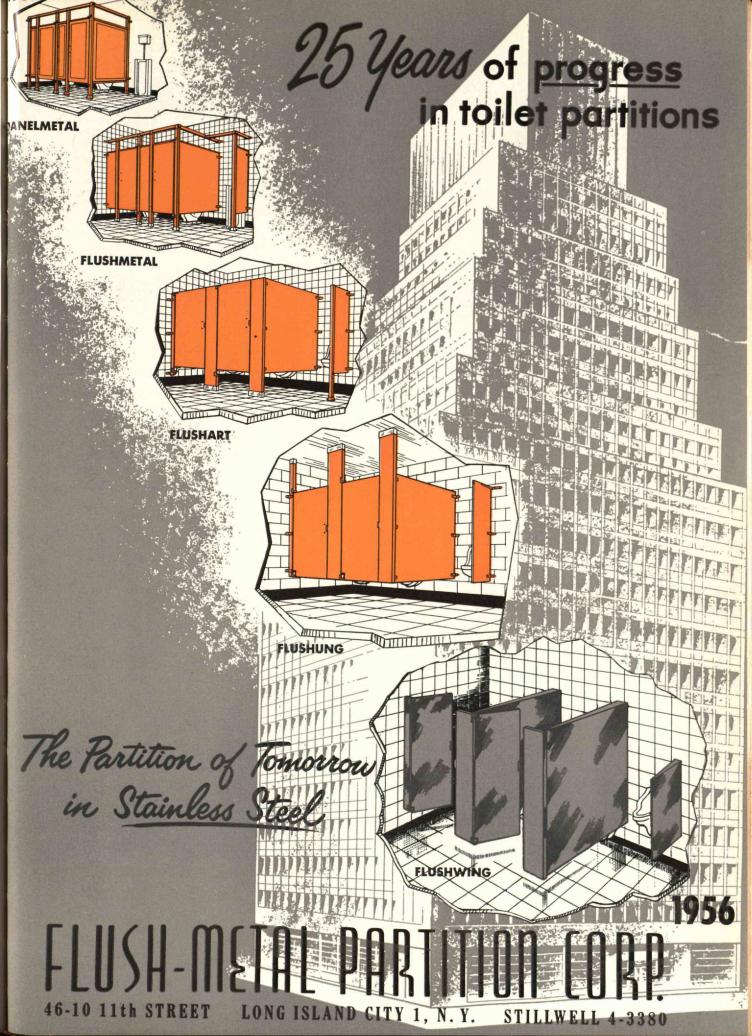
• 1956G •

Since this is our first Class column, it might be worthwhile to state the objectives via such a column. We feel gossip had more appropriately be left to the society page and undergraduate columns. What we will try to do is keep tabs as loosely or closely as you will permit by your own contributions on the professional and business side of your lives. We feel a man with a graduate degree from M.I.T. will reach the top of his particular field of technological endeavor sooner or later. Our goal is to inform you of graduates active in science and industry so that

you may be in a position to contact each other on the basis of your M.I.T. association.

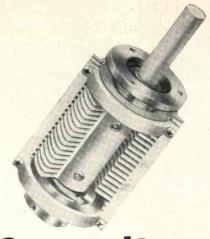
Thusly, we would like to report on the professional whereabouts of those we know about. Martin Robbins, S.M. in Ceramics will join the Perth Amboy Division of Du Pont, where he will be in charge of production facilities. Alan Cohen who recently married Patricia Ann Smith, Radcliffe '56, after finishing an S.M. in soils engineering will locate in New Jersey as a soils engineer. Another civil engineer, Ken Leet, may be reached at 293 Marlborough Street in Boston and is working for an engineering firm in Boston. Two physicists have announced job and wedding plans. Al Fein and Gene Gordon are both marrying B.U. graduates, Al going to Westinghouse in Pittsburgh, Gene to Sylvania in California. Lenny Weisbein, long time active in graduate student affairs, will transfer his responsible shoulders to American Cyanamid Research Labs in Bound Brook, N.J. Lenny received his Sc.D. in textile engineering. Our Class President, Tom Mix, will continue at M.I.T., after receiving his Sc.D. in chemical engineering, as a member of Chemical Engineering Practice School Staff. Recent graduates of the Chemical Engineering Practice School grind, Bruce Philips, George Gabour, Bill Dickenson, all S.M. by now, are in the process of job hunting between cocktail hours. Look for them as chemical industry titans in a few years. Over in the Biology and Food Technology Courses, Irv Melnick, S.M. in Biochemistry, is continuing his professional education at Hahnamen Medical College in Philadelphia. Also continuing on, for the Ph.D. in Food Technology, is Herb Houlton, S.M. this year. George Fuld who will receive a Sc.D. in Biochemical Engineering at the end of the summer plans to continue at M.I.T. as staff member. Another Sc.D. in Biochemical Engineering, Val Tereskavitch, will remain with Dewey and Almy in Boston, where he has been on the research staff for the past two years. Francisco Delvalle, S.M. in Biochemical Engineering this year will become a Sc.D. candidate in his field in the fall. Calvin Wolcott, whose enthusiasm as Graduate House athletic chairman, was responsible for the excellent record of Graduate House teams this past year, has been accepted into the Navy's Finance Corps program and will receive a commission after three months at Newport O.C.S., starting in June. Cal is now S.M. in Industrial Management.

Your graduate school colleagues want to find out what you are accomplishing professionally. Send news to Alumni Office M.I.T., or to your Class Secretary.—Charles T. Freedman, Secretary, Graduate House, M.I.T., Cambridge, Mass.









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